

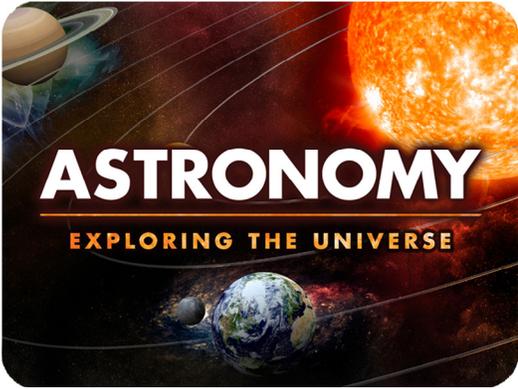


eDynamicLearning

— CAREER & ELECTIVE COURSES —



Course Syllabus



Astronomy: Exploring the Universe

Course Description

Why do stars twinkle? Is it possible to fall into a black hole? Will the sun ever stop shining? Since the first glimpse of the night sky, humans have been fascinated with the stars, planets, and universe that surrounds us. 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 solar system, the Milky Way and other galaxies, and the sun and stars. Using online tools, students will examine the life cycle of stars, the properties of planets, and the exploration of space.

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Unit 1: The Earth, Moon, and Sun Systems

Unit 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 the 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 the 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.

Assignments

Unit 1 Text Questions	Homework	10 points
Unit 1 Online Lab Questions	Homework	10 points
Unit 1 Discussion Assignment 1	Discussion	5 points
Unit 1 Discussion Assignment 2	Discussion	5 points
Unit 1 Quiz	Quiz	15 points



Unit 2: The Universe

Unit 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.

Assignments

Unit 2 Text Questions	Homework	10 points
Unit 2 Online Lab Questions	Homework	10 points
Unit 2 Discussion Assignment 1	Discussion	5 points
Unit 2 Discussion Assignment 2	Discussion	5 points
Unit 2 Quiz	Quiz	15 points



Unit 3: Stars

Unit 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.

Assignments

Unit 3 Text Questions	Homework	10 points
Unit 3 Online Lab Questions	Homework	10 points
Unit 3 Discussion Assignment 1	Discussion	5 points
Unit 3 Discussion Assignment 2	Discussion	5 points
Unit 3 Quiz	Quiz	15 points



Unit 4: Galaxies

Unit 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.

Assignments

Unit 4 Text Questions	Homework	10 points
Unit 4 Online Lab Questions	Homework	10 points
Unit 4 Discussion Assignment 1	Discussion	5 points
Unit 4 Discussion Assignment 2	Discussion	5 points
Unit 4 Quiz	Quiz	15 points



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 four units in this course (Note: You will be able to open this exam only one time.)

Assignments

Midterm Exam	Exam	50 points
Midterm Discussion Assignment	Discussion	5 points



Unit 5: Inner Planets

Unit Summary

The inner planets of our solar system are more closely related than the outer planets of the solar system. These planets are sometimes referred to as terrestrial planets and include Mercury, Venus, Earth, and Mars. Although all of these planets are notably rocky and dense, each one is unique.

In this unit, we will examine the formation of our solar system and describe the unique features of the four inner planets, Mercury, Venus, Earth, and Mars. We will compare and contrast the characteristics of the inner planets. Finally, you will discover the special attributes that make life on Earth possible.

Learning Objectives

- Describe how planetary matter is distributed within the solar system.
- Explain the formation of the solar system.
- Differentiate and describe the inner planets within our solar system.
- Identify the shared characteristics among all inner planets in the solar system.
- Explain the features of Earth that are essential to the development of life.

Assignments

Unit 5 Text Questions	Homework	10 points
Unit 5 Online Lab Questions	Homework	10 points
Unit 5 Discussion Assignment 1	Discussion	5 points
Unit 5 Discussion Assignment 2	Discussion	5 points
Unit 5 Quiz	Quiz	15 points



Unit 6: Outer Planets

Unit Summary

In this unit, we will examine the outer planets, Jupiter, Saturn, Uranus, and Neptune. We'll learn more about their structure, motion, atmosphere, and moons. We'll examine what space expeditions, observations, and mathematical predictions are telling us about these distant planets and their roles in our Solar System. Finally, we will learn more about the dwarf planet Pluto and examine the controversy over Pluto's reclassification as a dwarf planet from its former classification as our Solar System's ninth planet.

Learning Objectives

- Differentiate and describe the unique characteristics of the outer planets in the Solar System.
- Identify the shared features and characteristics among the outer planets in the Solar System.
- Describe the arrangement and distances between the outer planets.
- Explain why Pluto is no longer classified as a true planet of the Solar System.
- Compare and contrast the outer planets with Earth.

Assignments

Unit 6 Text Questions	Homework	10 points
Unit 6 Online Lab Questions	Homework	10 points
Unit 6 Discussion Assignment 1	Discussion	5 points
Unit 6 Discussion Assignment 2	Discussion	5 points
Unit 6 Quiz	Quiz	15 points



Unit 7: The Sun

Unit Summary

The Sun plays one of the most important roles in our Solar System and certainly life on Earth. In this unit, we will learn more about this closest star to Earth. We'll discuss the structure and composition of the Sun, including the different layers of the Sun's atmosphere. We'll also learn how the Sun creates energy through nuclear fusion and the process by which this takes place. Finally, we'll learn more about solar weather and the events that take place in and around the Sun, including sunspots, solar flares, and coronal mass ejections.

Learning Objectives

- Identify the five regions of the Sun.
- Discuss the structure and composition of the Sun.
- Learn about nuclear fusion in the Sun, including the proton-proton chain reaction.
- Examine solar activity, such as sunspots and solar flares.
- Define and discuss solar eclipses.

Assignments

Unit 7 Text Questions	Homework	10 points
Unit 7 Online Lab Questions	Homework	10 points
Unit 7 Discussion Assignment 1	Discussion	5 points
Unit 7 Discussion Assignment 2	Discussion	5 points
Unit 7 Quiz	Quiz	15 points



Unit 8: Comets, Asteroids, and Meteors

Unit Summary

In this unit, we will examine comets, asteroids and meteors. Although smaller than the Sun, Moon, and planets, these celestial bodies are an important part of our Solar System. They can also produce dramatic visions in the Earth's skies and have the potential to collide with the Earth. We'll consider their composition, structure, and function in our Solar System.

Learning Objectives

- Define comet, asteroid, meteoroid, meteor, and meteorite.
- Examine the origin of comets and how their tails form.
- Discuss the location of asteroids in the Solar System.
- Learn about the different types of meteorites.
- Investigate how comets, asteroids, and meteorites influence life on Earth.

Assignments

Unit 8 Text Questions	Homework	10 points
Unit 8 Online Lab Questions	Homework	10 points
Unit 8 Discussion Assignment 1	Discussion	5 points
Unit 8 Discussion Assignment 2	Discussion	5 points
Unit 8 Quiz	Quiz	15 points



Final Exam

Learning Objectives

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

Assignments

Final Exam	Exam	50 points
Class Reflection Discussion Assignment	Discussion	10 points