BAKER COLLEGE
STUDENT LEARNING OUTCOMES

PHY 3210 Principles of Astronomy
3 Semester Credit Hours

Student Learning Outcomes and Enabling Objectives

1. Compare and contrast the early views of the universe; from ancient times through the Renaissance to modern views of the universe.
    a. Compare the geocentric and heliocentric models of the solar system.
    b. Identify how ancient people made observations of the universe.
    c. Evaluate how telescopes, manned and unmanned space exploration, and spectroscopy enable the study of the universe.
2. Differentiate between the types of objects in the solar system.
    a. Differentiate among the terrestrial planets, jovian planets, and the minor planets.
    b. Describe characteristics of each of the major planets.
    c. Identify the composition, size, motion, and major features of each of the 8 major planets.
    d. Describe the physical properties of the different objects within the solar system.
    e. Compare and contrast the composition, structure, and motion of the Earth and Moon.
    f. Describe the characteristics of and differentiate between asteroids, meteoroids, and comets.
    g. Describe the structure and composition of the Sun.
3. Explain exotic space phenomenon.
    a. Discuss the characteristics of black holes, how they are formed, and how they are predicted by general relativity.
    b. Explain pulsars, gamma ray bursts, and neutron stars.
4. Analyze the theory of star evolution and classification.
    a. Describe the categories of stars.
    b. Explain spectral classifications.
    c. Describe how Hertzsprung-Russell (H-R) diagrams help to categorize stars.
    d. Explain the formation and life cycle of stars.
    e. Describe the types of stellar explosions and their causes.
    f. Explains are elements are formed in stellar explosions.

5. Identify the categories of galaxies.
    a. Categorize galaxies by shape and composition.
    b. Describe the properties of the Milky Way, our galaxy.
    c. Discuss how we came to understand that they Milky Way is a galaxy and its structure.
6. Explain current theories of the universe.
    a. Explain the Big Bang Theory as the leading theory in the birth of the universe.
    b. Explain when and where the Big Bang occurred.
    c. Describe the expansion and shape of the universe.
    d. Describe the characteristics of the early universe.
    e. Summarize the horizon and flatness problems.
    f. Describe the formation of the large-scale structures of the universe.
7. Describe some laws of physics that determine properties of the universe, such as:
    a. Kepler's Laws
    b. Newton's Laws
    c. Doppler shift
    d. Tidal force and the Roche Limit
    e. Electromagnetic waves
8. Explain exoplanets.
    a. Describe how exoplanets are discovered.
    b. Describe the properties and classifications of exoplanets.
9. Describe interstellar dust.
    a. Identify the types of interstellar matter.
    b. Explain emission nebulae.

These SLOs are not approved for experiential credit.

Effective: Fall 2017