

## General Education Course Objectives and Learning Outcomes

Course Name: Astronomy; Observational  
Astronomy Lab

Course Number: PHSC 1053; PHSC 1051

Submitted by:

Department: Physical Sciences

**COMMON COURSE OBJECTIVES AND STUDENT LEARNING OUTCOMES THAT ARE OR WILL BE LISTED ON THE SYLLABUS OF EVERY SECTION OF THIS COURSE:**

<p><i>Course objectives:</i></p>	<p>Students will gain a basic understanding of the natural laws governing the solar system, stars, galaxies, and the rest of the universe. Topics of the course include constellations, celestial motions, tools and methods of astronomical observations, the solar system, properties of stars and the interstellar medium, the birth, life and death of stars, our Milky Way galaxy, dynamics of stellar systems and other galaxies, and cosmology.</p>
<p><i>Student learning outcomes:</i></p>	<p>Students completing PHSC 1053 and PHSC 1051 will be able to:</p> <ul style="list-style-type: none"> <li>• Explain the fundamentals of the scientific method and how it applies to measurements.</li> <li>• Define the main features of the celestial sphere.</li> <li>• Describe how motions of the stars, Sun, Moon, and planets appear to us on Earth.</li> <li>• Explain Kepler’s three laws of planetary motion.</li> <li>• Explain Newton’s three laws of motion and law of universal gravity.</li> <li>• Describe how the objects in our solar system are identified, explored, and characterized</li> <li>• Apply the relationship between wavelength, frequency, and speed of light.</li> <li>• Discuss the physical properties of most stars found at different locations on the H–R diagram, such as mass, radius, luminosity, and temperature.</li> <li>• Describe the structure of the Milky Way Galaxy and how astronomers discovered it</li> <li>• Describe the discovery that galaxies getting farther apart as the universe evolves.</li> </ul>
<p><b>ADHE ACTS INFORMATION FOR THIS COURSE (IF APPROPRIATE)</b></p>	
<p><i>ACTS Course number:</i></p>	<p><i>PHSC 1204 (when PHSC 1053 is taken with PHSC 1051)</i></p>
<p><i>Copy the ACTS course objectives and learning outcomes:</i></p>	<p>The student will explain, describe, discuss, recognize, and/or apply knowledge and understanding of the following:</p> <ul style="list-style-type: none"> <li>• History of astronomy</li> <li>• Light and optics</li> <li>• The solar system</li> </ul>

- Celestial motions
- Kepler's Laws
- Newton's Laws
- Stellar properties
- Stellar evolution
- Star clusters, galaxies, cosmology

**WHICH ATU GENERAL EDUCATION GOALS DOES THIS COURSE FULFILL? (NO MORE THAN TWO)**

- Communicate effectively
  - Written communication
  - Oral communication
- Think critically
- Develop ethical perspectives
  - Diversity
  - Empathy
  - Leadership
- Apply scientific and quantitative reasoning**
  - **Scientific reasoning**
  - Quantitative reasoning
- Apply the value of the arts and humanities
- Practice civic engagement

**DESCRIPTION OF HOW THIS COURSE MEETS THE GENERAL EDUCATION GOALS CHOSEN ABOVE (TO BE INCLUDED ON THE SYLLABUS OF EVERY SECTION OF THIS COURSE)**

In this course students are introduced to the scientific principles governing the universe. Students will also learn how scientific reasoning allows us to make predictions or describe events occurring in distant parts of our solar system, our galaxy, or the universe.