

**Department:**

Physical Science

**Course Description:**

Provides a qualitative introduction to the nature of the solar system and beyond. The topics include: the celestial sphere, astronomical observation techniques, the planets and moons, asteroids and comets, the Sun, the lives and evolutions of stars, pulsars, black holes, galaxies and dark matter. This course is intended as a broad-based introduction to astronomy for students who are not majoring in science. Three hours of lecture and one and a half hours of lab per week.

**Course Competencies:**

The learning outcomes and competencies detailed in this syllabus meet or exceed the learning outcomes and competencies specified by the Kansas Core Outcomes Groups for this course as approved by the Kansas Board of Regents. **(Kansas Regents Shared Number Course and Title: KSRN Course PHY1020 Descriptive Astronomy Lecture and Lab.)**

Upon completion of this course, students will be able to:

1. Explain the scientific method
2. Interpret astronomical observations, demonstrate critical thinking and basic problem solving
3. Explain astronomical phenomena in terms of appropriate scientific models
4. Explain and critique science as presented in the media
5. Identify, locate and predict characteristics of celestial objects
6. Effectively utilize the tools of observational astronomy
7. Generate and communicate conclusions based on data and analysis of observations

**Course Content:**

- A. Observations of the sky
  1. Celestial sphere and coordinates
  2. Motions of celestial objects on the celestial sphere
  3. Lunar phases and eclipses
- B. Planetary motion
  1. Heliocentric model of the solar system
  2. The basic physics of an orbit
  3. Kepler's Laws of Planetary Motion
- C. Electromagnetic radiation
  1. The electromagnetic spectrum
  2. Blackbody radiators
  3. Spectroscopy
- D. Telescopes
- E. The Solar System
  1. Model of the Formation of the Solar System

2. Asteroids and comets
  3. The terrestrial planets
  4. The Jovian planets
  5. Planetary moons and rings
- F. The Sun
1. Solar composition
  2. Solar activity
- G. Stellar Evolution
1. Measuring the properties of stars
  2. Nebula and star forming regions
  3. Life cycles of stars
  4. Stellar remnants
- H. Galaxies
1. The Milky Way Galaxy
  2. Normal and active galaxies

## Learning Assessments:

Competencies will be evaluated primarily with exams and lab write-ups though an instructor may add additional measures.

## Instructional Materials:

Textbook: Chaisson, E. & McMillan, S. (2017). *Astronomy: A Beginner's Guide to the Universe* (8<sup>th</sup> ed.). New York, NY: Pearson. ISBN-13: 978-0134087702

### **Guidelines for Requesting Accommodations Based on Documented Disability or Medical Condition**

It is the intention of Highland Community College to work toward full compliance with the Americans with Disabilities Act, to make instructional programs accessible to all people, and to provide reasonable accommodations according to the law.

Students should understand that it is their responsibility to self-identify their need(s) for accommodation and that they must provide current, comprehensive diagnosis of a specific disability or medical condition from a qualified professional in order to receive services. Documentation must include specific recommendations for accommodation(s). Documentation should be provided in a timely manner prior to or early in the semester so that the requested accommodation can be considered and, if warranted, arranged.

In order to begin the process all students **must** complete the "Disabilities Self-Identification Form" on our [Disability Services website](#).

This form can also be accessed at the Highland Community College homepage under Students Services/Student Resources/Disability Service or by contacting the Disabilities Coordinator.

### **A Note on Harassment, Discrimination and Sexual Misconduct**

Highland Community College seeks to assure all community members learn and work in a welcoming and inclusive environment. Title VII, Title IX, and College policy prohibit harassment, discrimination and sexual misconduct. Highland Community College encourages anyone experiencing harassment, discrimination or sexual misconduct to talk to report to the Vice President for Student Services, the Human Resources Director or complete an [online report](#) about what happened so that they can get the support they need and Highland Community College can respond appropriately.

There are both confidential and non-confidential resources and reporting options available to you. Highland Community College is legally obligated to respond to reports of sexual misconduct, and therefore we cannot guarantee the confidentiality of a report, unless made to a confidential resource. Responses may vary from support services to formal investigations. As a faculty member, I am required to report incidents of sexual misconduct and thus cannot guarantee confidentiality. I must provide our Title IX coordinator with relevant details such as the names of those involved in the incident. For more information about policies and resources or reporting options, please review our [Equity Grievance Policy](#).