

**Chemeketa Community College**  
4000 Lancaster Drive NE  
PO Box 14007  
Salem, Oregon 97309

**Course Outline**

**Course Identification**      GS107      **Credits**      4      **Date**      12/05

**Course Title:** Introduction to Astronomy

**Total Instructional Hours, for Course, per Term:**

<u>33</u>	Lecture Hours	=	<u>3</u>	Credit(s)
<u>33</u>	Laboratory Hours	=	<u>1</u>	Credit(s)

**Prerequisite Course(s):**

None

**Required Text(s):**

Seeds, Michael, *Horizons: Exploring the Universe*, 8<sup>th</sup> Edition  
*Astronomy through Practical Investigation*, Lab Manual

**Course Description:**

Surveys the physical properties of planets, stars and galaxies. Emphasis the size of the universe and the objects within. Examines the process astronomers use to gather data and form models.

**Performance Based Learner Outcomes:**

Upon successful completion of the course, students should be able to:

1. Identify members of the solar systems and the Milky Way galaxy and locate them relative to one another.
2. Explain current models used by astronomers as they relate to the origin of the universe and its evolution.
3. Explain basic astronomical cycles involving the moon, planets and stars.
4. Evaluate the strengths and weaknesses of models based upon assumptions.

**Course Content Outline:**

- I. The Scale of the Cosmos (Week One)
  - A. Astronomical units of measurement
  - B. Major structures of the universe
  - C. Introduction of scientific method
- II. The Sky
  - A. Define the celestial sphere
  - B. Define stellar magnification scale
  - C. Introduction of scientific method

- III. Cycles of the Sky (Week Two)
  - A. Moon phases
  - B. Eclipses and tides
  - C. Sidereal and synodic lunar cycles.
- IV. Origin of Modern Astronomy
  - A. Greek Astronomy and the geocentric universe
  - B. Copernicus and the Heliocentric Universe
  - C. Kepler and Galileo
- V. Newton, Einstein and Gravity (Week Three)
  - A. Three laws of Newtonian Motion
  - B. Einstein's special and general theories
  - C. Curved space-time
- VI. Atoms and Energy Levels
  - A. Atoms and energy levels
  - B. Properties of stellar spectra
  - C. Chemistry and motion related to stellar spectra
- VII. The Sun (Week Four)
  - A. Three layers of solar atmosphere
  - B. Sunspots and the solar magnetic cycle
  - C. Properties of the photosphere
- VIII. Stellar Properties
  - A. Parallax and stellar distances
  - B. H-R diagram
  - C. Binary star systems
- IX. The Lives Of The Stars (Week Five)
  - A. Stellar fusion
  - B. Neutrino problem
  - C. Radiation laws and stable stars
- X. The Death of Stars
  - A. The main sequence and stellar aging
  - B. Red giants, white dwarfs, and neutron stars
  - C. Supernova events
- XI. Neutron Star and Black Holes
  - A. Stellar evolution and neutron stars
  - B. Pulsars
  - C. Black holes and relativity
- XII. The Milky Way Galaxy
  - A. Elements of the Galaxy
  - B. Distances and Dimensions of the Milky Way Galaxy
  - C. Spiral structure of the Galaxy
- XIII. Galaxies (Week Seven)
  - A. Classification of galaxies
  - B. Hubble's Law
  - C. Clusters of galaxies

- XIV. The Big Bang
  - A. Basic assumptions about the universe
  - B. Background radiation and the big bang
  - C. Evolution of the early universe
- XV. Fate of the Universe (Week Eight)
  - A. Dark matter and the fate of the universe
  - B. Grand unified model of the universe
  - C. Future of the universe
- XVI. Origin of the Solar System
  - A. Solar nebula and planetary motion
  - B. Properties of terrestrial and Jovian planets
  - C. Minor members of the solar system
- XVII. Planet Earth (Week Nine)
  - A. Inner earth and magnetic charge
  - B. Plate tectonics
  - C. Earth's atmosphere
- XVIII. Moon and Mercury
  - A. Lunar features
  - B. Lunar evolution
  - C. Mercury and the Moon, a comparison
- XIX. Venus and Mars (Week Ten)
  - A. Surface feature of each planet
  - B. Atmospheres of each planet
  - C. Space probe analysis of each planet
- XX. Jupiter and Saturn
  - A. Telescope and satellite view of each planet
  - B. Interior properties of Jovian planets
  - C. Natural satellites of Jupiter and Saturn
- XXI. The Outer Planet: Uranus, Neptune, and Pluto (Week Eleven)
  - A. Physical properties of each planet
  - B. Satellites of each planet
  - C. Discovery of each planet
- XXII. Meteorites, Asteroids, and Comets
  - A. Physical properties of each
  - B. Three types of meteorites
  - C. Origin of comets, asteroids, and meteorites