### Administrative Unit: Science Department

### Course Prefix and Number: ASTR 108

### Course Title: Introduction to Astronomy

### Number of Credit Hours: 3  Lecture Hours: 3  Laboratory Hours: 0

### Catalog Description:
A survey of the development of astronomy through the years. Topics covered include the historical evolution of our understanding of our place in the Universe, astronomical instruments, the Earth-Moon system, the solar system, the Sun and other stars, galaxies and cosmology. G.E.

### Prerequisite(s)/Corequisite(s):
None.

### Text(s):
Most current editions of the following:


### Course Objectives:
- To examine the major types of objects in the Universe and their properties.
- To describe the instruments and methods used by observational astronomers.
- To investigate scientific theories on the origin and structure of the Universe.

### Measurable Learning Outcomes:
- Describe the celestial sphere and the coordinate system used to specify locations on it.
- Outline the process by which the geocentric model of the Universe was supplanted by the heliocentric model.
- Differentiate between sidereal and solar time.
- Describe radar ranging and the parallax effect and how they are used to determine distances to celestial objects.
- State and apply Kepler’s laws of planetary motion.
- Interrelate the frequency, wavelength, and energy of light.
- Describe the electromagnetic spectrum.
• Define temperature and interconvert between temperature scales.
• Explain Wien’s law and emission and absorption spectra.
• Use the Doppler Effect to calculate the speed of celestial objects, relative to Earth.
• Explain the functioning of optical and radio telescopes, and compare their capabilities.
• Outline current theories of solar system formation, and describe terrestrial and jovian planets, asteroids, and comets.
• Describe current methods for detecting extrasolar planets.
• Describe the properties of the Moon, its phases, and its tidal effects on the Earth.
• Explain the structure and functioning of the Sun.
• Outline the lifecycles of stars.
• Locate various types of stars on the Hertzsprung-Russell diagram.
• Describe the different classes of galaxies.
• Explain Hubble’s law and how it relates to the Big Bang theory of the formation of the Universe.

Topical Outline (major areas of coverage):

• Time and Space
• General discussion about the composition of the universe
• Discussion about different branches of Astronomy
• Solar System--overview
• Different planets and their satellites
• Asteroids, Comets and Meteors
• The Sun
• The Stars--detailed discussions
• Galaxies
• Origin and Structure of the Universe

Recommended maximum class size for this course: 35

Library Resources: Online databases are available at http://www.ccis.edu/offices/library/resources.asp. You may access them from off-campus using your eServices login and password when prompted.

Prepared by: Frank Somer
Name ___________________________ Signature ___________________________
Date: October 21, 2005

NOTE: The intention of the master syllabus is to provide an outline of the contents of this course, as specified by the faculty of Columbia College, regardless of who teaches the course, when it is taught or where it is taught. Faculty members teaching this course for Columbia College are expected to facilitate learning pursuant to the course objectives and cover the subjects listed in the topical outline. However, instructors are also encouraged to cover additional topics of interest so long as those topics
are relevant to the course’s subject. The master syllabus is, therefore, prescriptive in nature but also allows for a diversity of individual approaches to course material.

Office of Academic Affairs
12/04