

North Hennepin Community College

PHYS 1050: Astronomy

A. COURSE DESCRIPTION

Credits: 4

Lecture Hours/Week: *.*

Lab Hours/Week: *.*

OJT Hours/Week: *.*

Prerequisites: None

Corequisites: None

MnTC Goals: Goal 03 - Natural Science

This course takes a "big picture" look at the universe as a whole. Topics include history of astronomy, origin and features of the planets and the Solar System, the lives and deaths of stars, cosmology and the fate of the universe. It also covers recent discoveries and current topics in astronomy. The laboratory component provides a variety of methods to more fully investigate the process of astronomy. The course meets requirements as a natural sciences lab course under Goal Area 3 of the Minnesota Transfer Curriculum. (3 hours lecture/week, 2 hours lab/week)

B. COURSE EFFECTIVE DATES: 05/24/2010 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

1. The topics to be covered include a description of celestial motions and their causes; seasons, eclipses, and lunar phases; a history of classical astronomy; the nature of light and spectra; features and origin of the Solar System and its components; the Sun as a star; stellar classification and evolution; the Milky Way Galaxy; types of galaxies and their characteristics; cosmology and fate of the universe..

D. LEARNING OUTCOMES (General)

1. Familiarity with the history of classical astronomy, and the ability to discuss its role in developing our present understanding of the Solar System.
2. Ability to explain the causes of ¿backyard¿ astronomical phenomena (motions of celestial objects, phases of the Moon, lunar and solar eclipses).
3. Knowledge of the properties and characteristics of light; ability to explain how atoms produce light; ability to describe how various types of light spectra are produced, and how these spectra are used in astronomy.
4. Familiarity with important features of the interior, crust, and atmosphere of both the Earth and the Moon, and the major processes that shape or affect the surface of each.
5. Ability to compare and contrast the various theories for the formation of the Solar System, and discuss the pieces of evidence in support of each theory.
6. Familiarity with a variety of the physical features and properties of the Solar System¿s planets, moons, etc, ability to compare and contrast these objects to another and understand the causes of
7. similarities and/or differences..
8. Knowledge of the characteristics/properties/processes associated with the Sun, and how these can be related to those of other stars.
9. Knowledge of how stars can be classified on the basis of such properties as luminosity, spectral class, mass, temperature, etc. and how these properties are determined; knowledge of the Hertzsprung-Russell diagram and how it can be used to discuss compare the various classes of stars.
10. The ability to describe and explain the events, physical processes, and stages involved in the formation, maturation, and ¿death¿ of stars.
11. Knowledge of the characteristics and properties of galaxies, and how these are determined.
12. Familiarity with the overall characteristics of the universe, and how the models of cosmology used to explain these features; demonstrate understanding of how the Hubble Law, Big Bang, Inflationary Theory, the cosmic microwave background, dark matter and dark energy play a role in explaining the formation and evolution of the universe.
13. (The above items are course-specific learner outcomes, which also meet MnTC Goal 3, Competency a)
14. Analyze, interpret and make predictions regarding astronomical phenomena by applying appropriate scientific theories, principles, and concepts. (MnTC Goal 3, Competencies a and b; MnTC Goal Area 2, Competencies a, b, and c)
15. Demonstrate knowledge of how astronomical information can be collected, analyzed and interpreted. (MnTC Goal 3, Competencies a and b; MnTC Goal Area 2, Competencies a, b, and c)
16. Clearly communicate their experimental findings, analyses, and interpretations both orally and in writing. (MnTC Goal 3, Competency c)
17. Demonstrate that they can organize and present scientific material in a coherent manner. (MnTC Goal 3, Competency c)
18. Demonstrate knowledge of how astronomy principles can be used to evaluate science- related societal issues. (MnTC Goal 3, Competency d; MnTC Goal Area 2, Competencies a, b, and c)

E. Minnesota Transfer Curriculum Goal Area(s) and Competencies

Goal 03 - Natural Science

1. Demonstrate understanding of scientific theories.
2. Formulate and test hypotheses by performing laboratory, simulation, or field experiments in at least two of the natural science disciplines. One of these experimental components should develop, in greater depth, students' laboratory experience in the collection of data, its statistical and graphical analysis, and an appreciation of its sources of error and uncertainty.
3. Communicate their experimental findings, analyses, and interpretations both orally and in writing.
4. Evaluate societal issues from a natural science perspective, ask questions about the evidence presented, and make informed judgments about science-related topics and policies.

F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

G. SPECIAL INFORMATION

None noted