

## **Common Course Outline for: PHYS 1114 Introductory Astronomy**

### **A. Course Description**

1. Number of credits: 4
2. Lecture hours per week: 3  
Lab hours per week: 2
3. Prerequisites: Eligible for MATH 1100 and READ 1106
4. Co-requisites: None
5. MnTC Goals: Goal 3 Natural Science

A one-semester introductory course in astronomy covering the tools and methods of astronomy and the physics of the solar system, stars, galaxies and the universe. This course requires a background in intermediate algebra. Laboratory includes tools and methods of astronomy, data collection and analysis, and observations (when feasible). Lecture 3 periods. Laboratory 2 periods. Meets Minnesota Transfer Curriculum Goal 3 (Natural Science) competencies a, b, and c.

**B. Date last revised:** April 2017

### **C. Outline of Major Content Areas**

1. Scales of the universe
2. Patterns and motions of the sky
3. Light and the electromagnetic spectrum
4. The solar system
5. Properties of stars and stellar evolution, galaxies, and the expansion of the universe.
6. Inquiry-based investigations focus on data collection methods and data analysis techniques in astronomy.
7. Additional topics may be drawn from the following: history of astronomy, laws of planetary dynamics, telescopes & optics, extrasolar planet discovery, special and general relativity, and big bang cosmology.

### **D. Course Learning Outcomes**

Upon successful completion of the course, the student will be able to:

1. Explain the use of the basic tools of astronomical measurement and research, and the application of the laws of physics to those measurements. (2c, 2d, 3c)
2. Explain the relationship between astronomical observations and astronomical theories. (2c, 3c)
3. Identify, classify, and name the features of various astronomical objects (planetary, stellar, galactic, cosmological). (2a, 2b, 2c, 3a)
4. Describe the evolution of the universe and entities within the universe such as planets, stars, and galaxies. (2a, 2c, 2d, 3a)
5. Use astronomical terms intelligently. (3a)

6. Use laboratory equipment and software to perform experiments. (2a, 2b, 3b)
7. Relate and apply textbook and classroom material to laboratory experiences. (2a, 2b, 2c, 3b)
8. Communicate findings, analyses, and interpretations of laboratory work. (2a, 3a, 3b, 3c)
9. Perform simple calculations related to astronomy and interpret graphical representation of data. (3c)

**E. Methods for Assessing Student Learning:** Assessment methods are at the discretion of the instructor and may include written and/or oral reports, homework, projects, quizzes, exams, a final exam, and laboratory projects.

**F. Special Information:**

1. A simple scientific calculator and internet access are required.
2. This course is *not* a sequel to Physics 1104, Survey of Astronomy. The content of this laboratory course is similar to 1104 and students will not be able to transfer both courses.