1. **COURSE ID:** ASTR 101   **TITLE:** Astronomy Laboratory
   Units: 1.0 units **Hours/Semester:** 48.0-54.0 Lab hours
   Method of Grading: Letter Grade Only
   Prerequisite: MATH 110, and completion of or concurrent enrollment in ASTR 100, or ASTR 115 or ASTR 125 .

2. **COURSE DESIGNATION:**
   Degree Credit
   Transfer credit: CSU; UC
   AA/AS Degree Requirements:
       CSM - GENERAL EDUCATION REQUIREMENTS: E5a. Natural Science
   CSU GE:
       CSU GE Area B: SCIENTIFIC INQUIRY AND QUANTITATIVE REASONING: B3 - Laboratory Activity
   IGETC:
       IGETC Area 5: PHYSICAL AND BIOLOGICAL SCIENCES: C: Science Laboratory

3. **COURSE DESCRIPTIONS:**
   Catalog Description:
       Constellation identification, understanding of right ascension and declination, and basic astronomical measurements of our moon, planets, and stars. Occasional telescopic observations using CSM's observatory. With ASTR 100, ASTR 115, or ASTR 125, satisfies lab requirements for UC and California State Universities. Extra supplies may be required.

4. **STUDENT LEARNING OUTCOME(S) (SLO'S):**
   Upon successful completion of this course, a student will meet the following outcomes:
       1. Use a planisphere to identify and determine the visibility of stars and constellations.
       2. Analyze and explain the moon's phases.
       3. Explain the operation of a typical telescope.
       4. Evaluate the different types of optical spectra.
       5. Recognize some of the more common Messier objects.

5. **SPECIFIC INSTRUCTIONAL OBJECTIVES:**
   Upon successful completion of this course, a student will be able to:
       1. Use a planisphere to identify and determine the visibility of stars and constellations.
       2. Analyze and explain the moon's phases.
       3. Explain the operation of a typical telescope.
       4. Evaluate the different types of optical spectra.
       5. Recognize some of the more common Messier objects.

6. **COURSE CONTENT:**
   Lab Content:
       1. Constellation identification
       2. Sidereal time
       3. Right Ascension and Declination
       4. Telescopes
       5. Lunar phases
       6. Spectral analysis
       7. HR Diagram
       8. Deep sky objects (including Messier objects)

7. **REPRESENTATIVE METHODS OF INSTRUCTION:**
   Typical methods of instruction may include:
       A. Other (Specify): Students perform lab experiments using their planisphere and the Observer's Sky Atlas to determine rise/set times of stars, visibility during a particular season, etc. They also use the planetarium program, Starry Night, supplied on department computers, to determine extrasolar planet characteristics,

duration of daylight on the solstices and equinoxes, etc.

8. **REPRESENTATIVE ASSIGNMENTS**
Representative assignments in this course may include, but are not limited to the following:
Writing Assignments:
    Complete weekly lab reports.
Reading Assignments:
    This is a lab course, so there are no outside reading assignments.
Other Outside Assignments:
    Students are encouraged to use their planispheres on any clear night of their choice between lab sessions. This is to enable the students to gain practice in identifying constellations.

9. **REPRESENTATIVE METHODS OF EVALUATION**
Representative methods of evaluation may include:
    A. Exams/Tests
    B. Lab Activities
    C. Students are graded on their weekly lab reports. There should be a final exam counting for at least 20% of their lab grade.

10. **REPRESENTATIVE TEXT(S):**
Possible textbooks include:
    A. David Chandler. *The Night Sky planisphere*, ed. -, 1992
    B. E. Karkoschka. *The Observer's Sky Atlas*, 3rd ed. Springer, 2007
Other:
    A. Note: The planisphere is copyright dated 1992 and is a standard star/constellation location device used in astronomy labs. It is timeless, since stars' positions don't change.

Origination Date: September 2020
Curriculum Committee Approval Date: October 2020
Effective Term: Fall 2021
Course Originator: Darryl Stanford