Assessment for Astronomy 101L
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The Department of Physics and Astronomy has set the following goals for Astronomy 101L.

Goals:

1. Students will develop an understanding of the process of scientific inquiry.

2. Students will be able to apply simple quantitative analysis to scientific problems.

3. Students will be able to apply scientific thinking to real world problems.

4. Students will increase their understanding of and enthusiasm for astronomy.

The success in meeting these goals will be assessed by the following outcomes. The outcomes were chosen to cover some of the most important topics and to demonstrate a range of skills that can be measured, not necessarily to cover all the topics in the course.

Outcomes:

Outcome 1: Knowledge of Basic Laws of Physics Related to Astronomy and Use of Units: Students will be able use basic laws of physics related to astronomy to estimate answers to various problems. Students will be able to recognize metric units and the correct units in which to measure various astronomical properties.

NM HED Area III competency 2 and 4: Solve problems scientifically. Apply quantitative analysis to scientific problems including showing familiarity with the metric system

Outcome 2: Basic Astronomical Phenomena: Students will understand basic everyday concepts like seasons, the rising and the setting of the Moon and its appearance, and our place in the universe. Students will recognize valid explanations of these phenomena.

NM HED Area III competency 3. Communication of scientific information.

Outcome 3: Origin and Nature of the Universe: Students will understand the origin and nature of the universe – subjects with relevance to contemporary societal issues.

NM HED Area II competency 3 and 5. Communicate scientific information. Apply scientific thinking to real world problems.

Assessment Data Collection:

The assessment will be based on questions and problems students must answer as they progress through the labs. A statistically significant subsample of students in the lab will be used.

Rubric:

SLO 1 will be assessed via three questions on units and dimensions from the Foundations lab, and three questions on Kepler's Laws from the Kepler's Laws lab. SLO 2 assessment is based on a question regarding the nature of seasons from the Kepler's Laws lab, one on retrograde motion of the planets from the same lab, and one on the nature of parallax from the Parallax lab. SLO 3 will be assessed via three questions on the Hubble Constant and the age of the Universe from the Cosmology lab.

The SLO can be assessed with either of two methods. Method 1 assesses students' performance based on the percentage of questions they answered correctly in each rubric as a group. The instructor can then examine the percentage of students demonstrating Exemplary, Satisfactory, or Unsatisfactory performance on each SLO. Method 2 is more simply based on the average score of all students on all questions in each rubric. The instructor can use this average score to decide if the class performance as a whole is Exemplary, Satisfactory, or Unsatisfactory. The table below provides more detail on what is meant by Exemplary, Satisfactory, or Unsatisfactory performance on each SLO.

Astronomy 101L Rubric for Grading Outcomes Assessment

Outcome	Assessment Questions	Exemplary	Satisfactory	Unsatisfactory
Knowledge of Basic Laws of Physics Related to Astronomy and Use of Units	3 questions on units and 3 on laws	For each set of 3 questions, all 3 questions correct or an average score of >75%	For each set of 3 questions, 2 questions correct or an average score of 60-75%	For each set of 3 questions, 0-1 questions correct or an average score of <50%
Basic Astronomical Phenomena	3 questions	3 questions correct or an average score of >75%	2 question correct or an average score of 60-75%	0-1 questions correct or an average score of <50%
Origin and Nature of the Universe	3 multiple choice questions	3 questions correct or an average score of >75%	2 question correct or an average score of 60-75%	0-1 questions correct or an average score of <50%