Course Title & Number: PHY110: Introductory Physics

Competency Area: **SCIENTIFIC REASONING** (Goal: Students will become familiar with science as a method of inquiry. Students will develop a habit of mind that uses quantitative skills to solve problems and make informed decisions.)

Faculty submitting the Learning Outcomes: Pete Benzi ***Date***: 3/7/2013

[Instructions: *Please match the Learning Outcomes in the left hand column to those of the course you are submitting for Gen Ed approval. List the corresponding course outcomes in the right hand column to indicate a match.*]

BOR TAP's Learning Outcomes	Corresponding Outcomes for Course Named Above
1. Explain the methods of scientific inquiry that lead to the acquisition of knowledge. Such methods include observations, testable hypotheses, logical inferences, experimental design, data acquisition, interpretation, and reproducible outcomes.	• Recognize the differences between one-dimensional motion and two-dimensional motion and apply those results • Apply the laws of thermodynamics to solve problems. • Construct data tables, graphs and charts from data collected in a laboratory. • Evaluate the rigor of conclusions from laboratory experiments by comparing different data sets. • Present data and conclusions in a coherent lab report.
2. Apply scientific methods to investigate real-world phenomena, and routine and novel problems. This includes data acquisition and evaluation, and prediction.	• Distinguish between position, velocity and acceleration and employ those concepts to solve one-dimensional motion problems. • Recognize the differences between one-dimensional motion and two-dimensional motion and apply those results • Classify types of energy and use Conservation of Energy to solve motion problems. • Apply the laws of thermodynamics to solve problems.
3. Represent scientific data symbolically, graphically, numerically, and verbally.	• Distinguish between position, velocity and acceleration and employ those concepts to solve one-dimensional motion problems. • Describe Newton's Laws of Motion and apply them to solving motion problems. • Construct data tables, graphs and charts from data collected in a laboratory. • Evaluate the rigor of conclusions from laboratory experiments by

	comparing different data sets. • Present data and conclusions in a coherent lab report.
4. Interpret scientific information and draw logical references from representations such as formulas, equations, graphs, tables, and schematics.	• Distinguish between position, velocity and acceleration and employ those concepts to solve one-dimensional motion problems. • Recognize the differences between one-dimensional motion and two-dimensional motion and apply those results. • Describe Newton's Laws of Motion and apply them to solving motion problems.
5. Evaluate the results obtained from scientific methods for accuracy and/or reasonableness.	• Evaluate the rigor of conclusions from laboratory experiments by comparing different data sets.
	Additional Outcomes List Kepler's Laws of Planetary Motion and show how they are consistent with Newton's Law of Gravitation Discuss the three basic phases of matter and how to define and measure their properties. Employ Conservation of Momentum to solve collision problems. Apply the basic laws that describe electric phenomena to solve problems. Identify the basic behavior of magnetic phenomena and relate these to electric phenomena. Discuss how the concept of energy and momentum conservation is preserved through various scientific theories. Compare Kepler's Laws of Planetary Motion to Newton'sLaw of Gravitation and explain how they are consistent.
