

Classical Physics Objective Rubric

Course: _____

Date: _____

Assignment: _____

Instructor: _____

Objective: *Students will apply understanding and skill related to the principles and concepts of classical physics essential for graduate school and/or professional employment in the field.*

Measure: *Student knowledge for each student learning objective in every mastery level course will be assessed by embedded questions in exams and assignments.*

Target: *Physics majors on a 5 year rolling average will score an average of at least 3.0 out of 5.0 on all classical physics SLO's.*

Instruction: Assess each classical physics on your exam or assignment and enter the average performance score for all physics majors using a scoring system of 0 (Lowest) through 5.0 (Highest). If SLO was not assessed, mark N/A.

#	Student Learning Outcome	Score
1.	Demonstrated ability to state definitions of position, velocity, and acceleration and applied the concepts to describe the motion of simple systems.	
2.	Demonstrated ability to solve mechanics problems using Newton's laws in both rectangular and non-rectangular coordinate systems.	
3.	Demonstrated ability to solve problems using work and energy concepts.	
4.	Demonstrated ability to solve problems using conservation of linear momentum.	
5.	Demonstrated ability to solve physics using conservation of angular momentum.	
6.	Demonstrated ability to solve problems involving harmonic oscillations with and without damping and external excitations.	
7.	Demonstrated ability to use generalized coordinates to find the Lagrangian and Hamiltonian of a simple system.	
8.	Demonstrated ability to apply Lagrangian and Hamiltonian mechanics to solve for the motion of simple mechanical systems.	
9.	Demonstrated ability to solve electrostatic problems involving point charges and charge distributions.	
10.	Demonstrated ability to solve electrostatic Poisson's and Laplace's equations using method of images, separation of variables, series solutions, and multipole expansions.	
11.	Demonstrate ability to solve for the magnetic field created by a line, area, or volume current density.	
12.	Demonstrated ability to write Maxwell's equations in both integral and differential form and use them to solve physics problems.	
13.	Demonstrated ability to state the postulates of thermodynamics and statistical mechanics and apply these concepts to solve problems.	
14.	Demonstrated ability to apply simple models of thermodynamics systems (Ideal Gas, Einstein Solid, etc.) and formal thermodynamic relationships to solve physics problems.	
15.	Demonstrated ability to solve thermodynamics problems using Legendre Transforms and alternative formulations.	
16.	Demonstrated ability to solve problems in statistical mechanics.	