PH1140 Oscillations and Waves Laboratory Experiments

1. Simple Harmonic Motion	The purpose of this lab experiment is to study: • simple harmonic motion of a mass-spring system • how the mass and spring constant affect the frequency of the mass-spring oscillator • the effect of different drag force on the mass-spring oscillator
2. Periodic Motion of Physical Pendulum	The goals of this experiment are to study the motion of a physical pendulum. The physical pendulum oscillations are similar to the simple pendulum ones, but it can no longer be modeled as a point mass on a string.
3. Standing Waves on a String	The goals of this lab experiment are: • Learn how to calculate the fundamental frequency of a string of given linear mass density and at a given • tension. Adjust the frequency of the driver so that the string vibrates in the fundamental mode. • Set up other standing wave patterns on the string. • Relate the frequency of the various harmonics to that of the fundamental mode of vibration. • Describe the terms amplitude, frequency, wavelength, node, and antinode as they relate to vibrating strings. • Determine the velocity of waves in the string; Relate wave velocity to the tension of the string and its linear density.
4. Speed of Sound	The purpose of this lab experiment is to: • study standing waves in air columns at different frequencies • use the principle of resonance to determine the wavelength of sound waves • determine experimentally the speed of sound in air

5. Project – Doppler's effect for sound	You will work in groups of 2 to 3 students only. Each group member will present their idea/method/experiment on Doppler Effect for Sound. Each group member will submit the Project Proposal pdf on Canvas Individually. The 2-3 different ideas will be tested in Lab class as scheduled (see Canvas). You will decide which of the 2-3 ideas/experiments will be presented as scheduled (see Canvas).