**Experiment Mass-Spring Oscillator - Lab Report**

**1. Now it’s time to check theory with experiment. In theory the spring constant of two springs in series is given by the following equation: (kseries)−1 = (k1)−1 + (k2)−1. Furthermore, the theoretical uncertainty in the series spring constant is given by the equation: Δkseries = kseries2((Δk1/k12) + (Δk2/k22)), where Δksubscript is the uncertainty of the spring identified by the subscript.**

**Use these two equations to determine the theoretical series spring constant plus uncertainty based on your measurements, and then compare it to the directly-measured value (plus uncertainty). If you made a careful set of measurements throughout this Part 1, you should find that the theoretically-determined spring constant plus uncertainty overlaps nicely with the experimentally-determined value plus uncertainty. If theory and experiment do not overlap (even closely), check carefully through your work looking for any obvious flaw in you measurements or calculations.**

**2. Determine the period of motion by dividing the time interval by the number of positive-going peaks traced out during that interval. The period of motion is given by: T = 2π(m/k)1/2, where m is the total mass hanging on the spring and k is the spring constant of the spring system. Determine the theoretically-predicted value for the period, and write down both that and your experimentally-measured value. Do this for each of the three situations considered in this experiment.**

**3. A useful way to characterize how well experiment and theory compare is to compute percentage deviation, defined to be (T1 – T2)/T1, where the 1 and 2 can represent theory and experiment, respectively, or vice versa. Compute the percentage deviation for each of the three cases considered. With any luck, your comparisons should be maybe 0.01 = 1% or less. If not, and if there is no obvious flaw to correct, you should try for better precision in the next experiment.**