LAB 3 Grading  
Harmonic Oscillations  
Fall 2008  

Total Points: 250

**OBJECTIVE – 20 points**  
- Purpose of lab measurements – 5 pts  
- Motivation – 10 pts  
- Educational Goals of the lab – 5 pts

**METHODS –**  
- Description of Methods – 100 points  
  o Load Cell Calibration – 5 pts  
  o Test Sample Prep - 14 pts  
  o Pre-test measurements – 8 pts  
  o Material Test Procedure – 46 points  
  o Data Reduction (Two choices) – 15 points  
  o Plotting – 12 points

**RESULTS/DISCUSSION**

- Graphs – 50 points  
  o Plot 1: Equilibrium stress-strain behavior  
    ▪ Included plot – 2 pts  
    ▪ Labels for axis and title including dimension – 1 pt  
    ▪ Values correct – 6 pts  
  o Plot 2: Reduced relaxation curves  
    ▪ Included plot – 2 pts  
    ▪ If data not normalized, lose – 2 pts  
    ▪ If data is not on 3 subplots, lose – 1 pt  
    ▪ X-axis is logtime – 1 pt  
    ▪ Labels for axis and title including dimension – 1 pt  
    ▪ Plots are correct (do not remove any additional points for not normalizing the data) – 6 pts  
  o Plot 3: Dynamic Stiffness  
    ▪ Included plot – 2 pts  
    ▪ All three strain levels on one plot – 3 pts  
    ▪ Labels for axis and title and curves, including dimensions – 1 pts  
    ▪ Both axis in log scale – 1 pt  
    ▪ Values correct – 7 pts  
  o Plot 4: Phase Shift  
    ▪ Included plot – 2 pts  
    ▪ All three strain levels on one plot – 3 pts  
    ▪ Labels for axis and title and curves, including dimensions – 1 pt  
    ▪ Radians/s on x-axis in log scale – 1 pt
- Plot Interpretation (Answers may vary) – **50 points**
  o Plot 1. Equilibrium stress-strain behavior.
    ▪ Describe the shape of the curve. Discuss reasons for linear and non-linear regions. – **6 pts**
  o Plot 2. Reduced relaxation curves.
    ▪ Describe the shape of the curve. – **2 pts**
    ▪ For full credit comment on the similarities / differences between strain levels. – **4 pts**
  o Plot 3. Dynamic Stiffness.
    ▪ Describe how dynamic stiffness is affected by frequency. – **3 pts**
    ▪ Describe how dynamic stiffness is affected by strain level – **3 pts**
    ▪ Explain the physical interpretation. – **6 pts**
  o Plot 4. Phase Shift.
    ▪ Describe how phase shift is affected by frequency. – **3 pts**
    ▪ Describe how dynamic stiffness is affected by strain level. – **3 pts**
    ▪ Explain the physical interpretation. – **6 pts**
  o Explanation for results
    ▪ Are graphs as expected or not as expected. – **4 pts**
    ▪ If data does not look correct (most don’t to some regard). Discuss reasons for error. – **10 pts**

**FORMATTING/GRAMMAR/STYLE – 30 points**
- Following directions for upper left corner – **5 pts**
- Professional appearance – **10 pts**
- Readability / grammar / writing skillz – **15 pts**