1. What is the equation of motion of this system?

2. What is the frequency of free vibration response without damping?

3. If we add damping, how does this change the free vibration frequency?

4. Sketch the damped free vibration response to an initial displacement?

5. What is the meaning of critically damped and damping ratio?

6. If we drive it with \( F(t) = F_0 \sin \omega t \), at what frequency is the steady state response? How long does a system driven harmonically at resonance take to reach steady state.

7. How many natural frequencies does this system have? What do the mode shapes look like.

8. How many natural frequencies does a piano string have?

9. What are the approximate bending mode shapes for the first and second modes of a ship hull. Can you suggest a simple way to obtain estimates of the corresponding natural frequencies.

10. Rate your Matlab ability on a scale of 1 to 10, with 10 being an expert.

11. What grade are you willing to work for in this subject.

12. Is there anything unusual that you would like me to know about you? E.g. are you a musician? Are you a grad student with an unusual background?