Reading: Chapters 6.1-5, 8.1-3
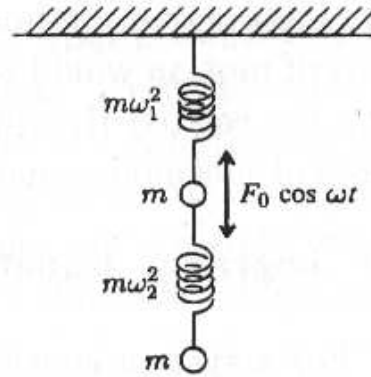
Problems:

1. Goldstein, Problem 6-18.

2. (From Dec '03 Final:) Three beads of mass m, $2m$ and m, respectively, are threaded onto three parallel rods, a distance d apart from each other as shown. The beads are connected with springs characterized by a spring constant k. (Assume that the length of unstretched springs is zero.) The beads can move along the rods without friction.
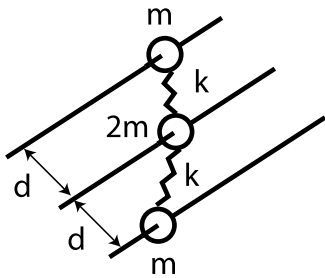
Find the normal modes of oscillation of the bead system (frequencies and amplitude vectors - no particular normalization required). Discuss those modes.

3. A mass m is suspended from a support by a spring with spring constant $m\omega_1^2$. A second mass m is suspended from the first by a spring with spring constant $m\omega_2^2$. A vertical harmonic force $F_0 \cos \omega t$ is applied to the upper mass. Find the steady-state motion for each mass. Examine what happens when $\omega = \omega_2$.

4. Goldstein, Problem 8-1.