5.1 (10 points) Goldstein 6.4

5.2 (10 points) Consider the coupled pendulum shown below. Two masses, m_1 and m_2, hang from strings of length l. The masses are coupled by a spring that has spring constant k and whose unstretched length b is equal to the distance between the strings' supports.
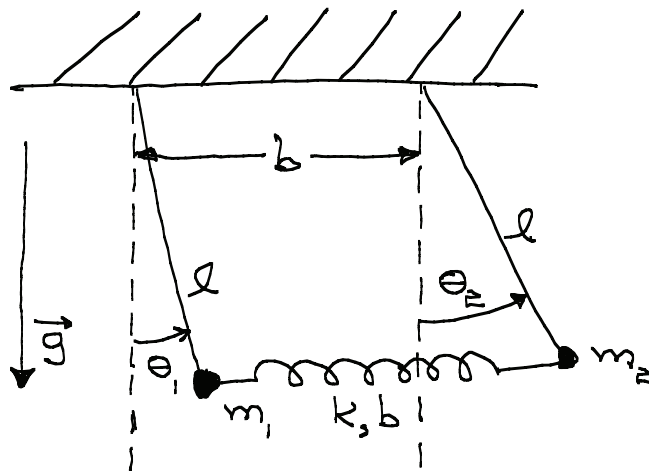
(a) Find the kinetic energy T and potential energy V in the limit of small oscillations, and extract from them the kinetic-energy matrix T and the potential-energy matrix V.

(b) What are the frequencies of the normal modes?

5.3 (10 points) Challenge problem