**SP 7.1** Determine the flexibility influence coefficients for the beam-mass system shown. Include two degrees of freedom (vertical translation and in-plane rotation).

![Beam-mass system diagram]

**SP 10.1** Solve problem 7.47 with \( U(t) = u_0 \sin \omega t \) and \( \omega = 4.5\sqrt{EI/mH^3} \).

**SP 10.2** Consider problem 7.47 with \( U(t) = u_0 \sin \omega t \) and determine the frequency response function \( g_{jk} \). Plot \( g_{jk} \) as a function of the dimensionless frequency \( \omega / \sqrt{EI/mH^3} \).

**SP 11.1** Consider the damped 2 DOF system shown. Determine

a) the undamped natural frequencies and normal modes,

b) the damped frequencies, damping ratios, and complex modes,

c) the damped frequencies and the damping ratios using the diagonal part of \( [C] = [u]^T [c] [u] \), where \([u]\) is the undamped modal matrix.

![2 DOF system diagram]

\[ c = 2\sqrt{km} \]