Problem 1: The structure shown below forms a parallel plate capacitor of length $L$ and depth $D$ with an air gap $g$ with the top silicon acting as a beam. The dark parts are conducting silicon and the clear part is silicon oxide. The two terminals are connected to a voltage source $V_S$. Find the deflection of the tip of the beam as a function of the given variables and $E$, the Young’s modulus of silicon. Assume the oxide anchor and the bottom silicon are rigid bodies and that the deflection is so small that the plates remain parallel. Hint: You may want to check your analysis using the BeamView applet located at http://www.engapplets.vt.edu/statics/BeamView/BeamView.html.