ECE 321 - Homework #26

Filter Design in Matlab

1) Use *fminsearch()* to find the 'optimal' filter of the form

$$Y = \left(\frac{bd}{\left(s^2+as+b\right)\left(s^2+cs+d\right)} \right) X$$

so that the gain vs. frequency is as close as possoble to an ideal low-pass filter

$$G_{ideal}(j\omega) = \left\{ \begin{array}{ll} 1 & 0 < \omega < 5 \\ 0 & otherwise \end{array} \right\}$$

2) Design a circuit to implement this circuit

3) Test your design in PartSim: Assume a load of 1k Ohms is added (should be part of the requirements: capable of driving a 1k Ohm load)

4) Build your circuit and check the gain vs. frequency against your calculations and simulation results.