ECET 337
Low and High Pass Filter Project Demonstration

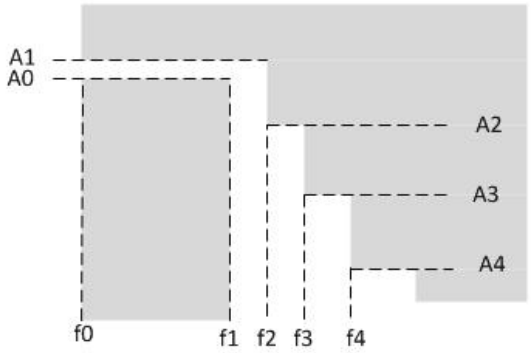
A. Filter Specifications

Filter Design Problem

Enter the first five non-zero digits of your Purdue ID number: **You entered 12345**

You are correct. Previous Tries

Build a filter with the following characteristics.



	f(Hz)	*A*(dB)	Matlab	Multisim	Hardware
0					
1					
2					
3					
4					

1. Pass band ripple___ dB to___ dB => Type of filter _____
2. A_o = _____
3. Pick $\underline{f_{-3dB}} =$ _____
4. A second order filter will give _____ A 4th order filter will give _____.
   Pick _____

B. Coefficients

Table 7-5 Higher order filter damping (α) and low pass frequency correction factors

Filter Order	Section		Bessel	Butterworth	1 dB Chebyshev	2 dB Chebyshev
	1	α	—	—	—	—
3		k_{lp}	0.753	1	2.212	3.105
	2	α	1.447	1	0.496	0.402
		k_{lp}	0.687	1	1.098	1.095
	2	α	1.916	1.848	1.275	1.088
4		k_{lp}	0.696	1	1.992	2.146
	2	α	1.241	0.765	0.281	0.224
		k_{lp}	0.621	1	1.060	1.057

A_o = _____

a_1 = _____

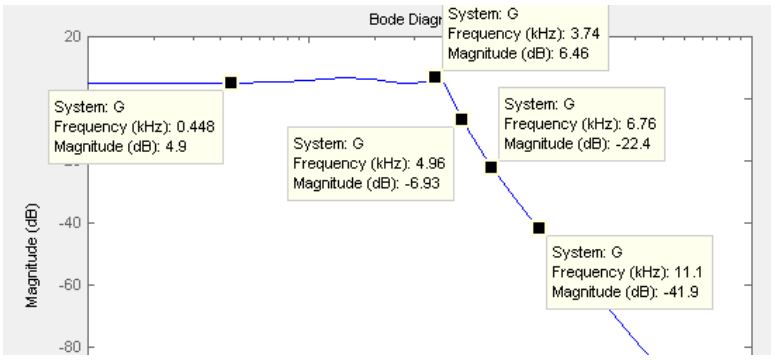
k_{lp1} = _____ f_{-3dB} = _____

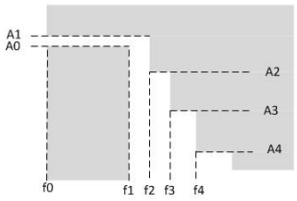
a_2 = _____

k_{lp2} = _____ f_{-3dB} = _____

C. Matlab

```
clear
format short G
s=tf('s')

Ao= _____;

f3dB=_____;
fo1=f3dB_____;
wo1=_____;
fo2=_____;
wo2=_____;

alpha1=_____;
alpha2=_____;

G=Ao*(wo1^2/(s^2+alpha1*wo1*s+wo1^2))*(wo2^2/(s^2+alpha2*wo2*s+wo2^2))
ltiview('bode',G)
```





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D. Sallen Key Design

Stage 1

f_{o1} = _____

Pick C = 10 nF

R _____

A_{int1} = _____

Pick R_{i1} = 10 kΩ

R_{f1} = _____

Stage 2

f_{o2} = _____

Pick C = 10 nF

R = _____

A_{int2} = _____

Pick R_{i2} = 10 kΩ

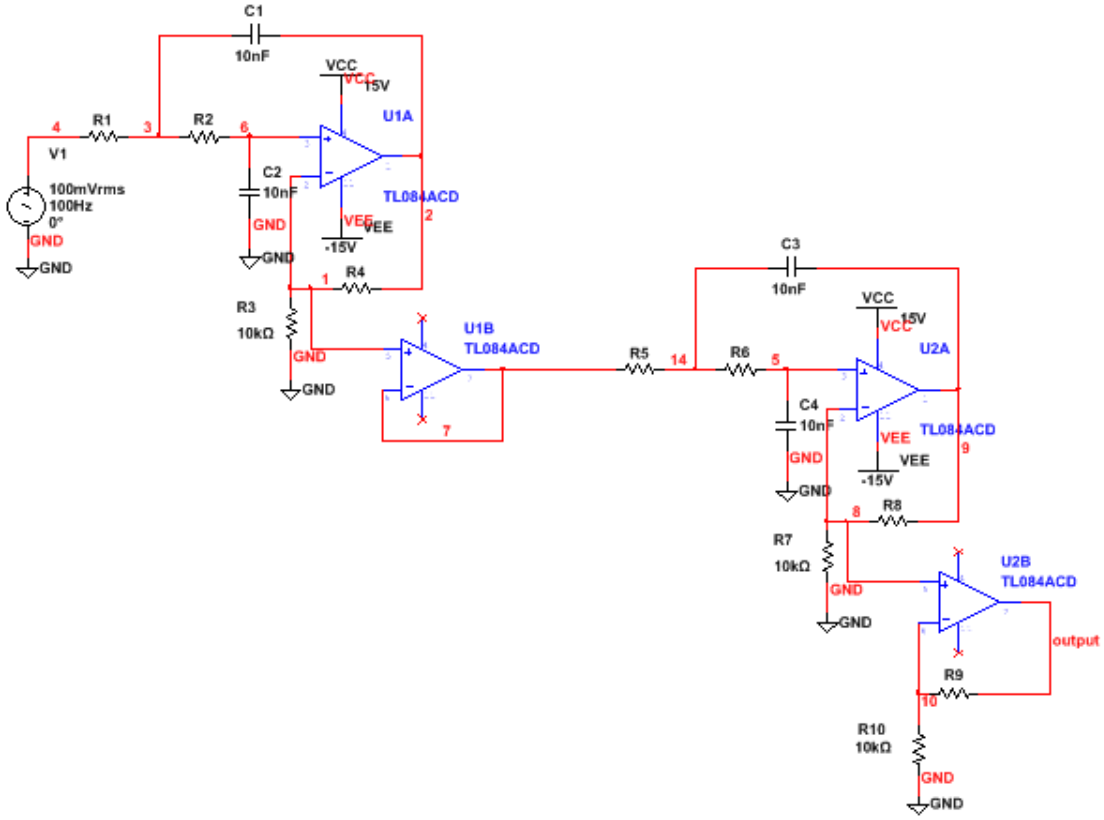
R_{f2} = _____

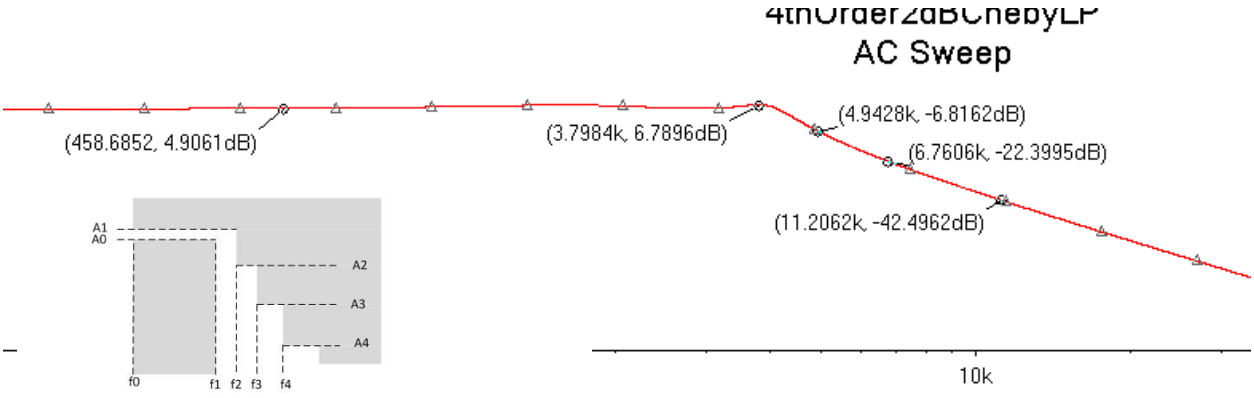
Gain stage

A_o = _____

Pick R_{i3} = 10 kΩ

R_{f3} = _____





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