EE387-SIGNAL PROCESSING
LAB 04-FILTER DESIGN USING MATLAB

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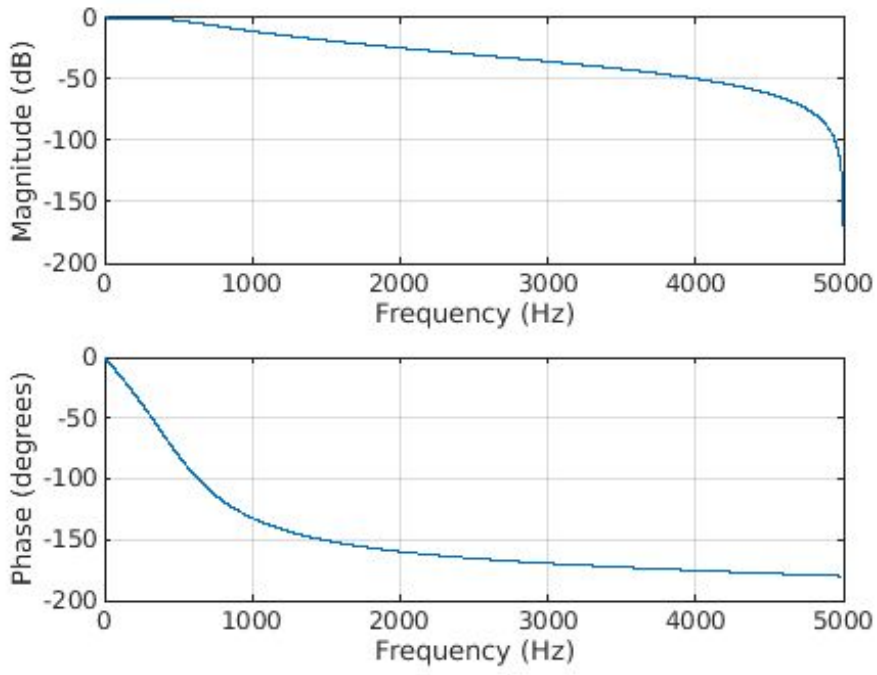
Exercise

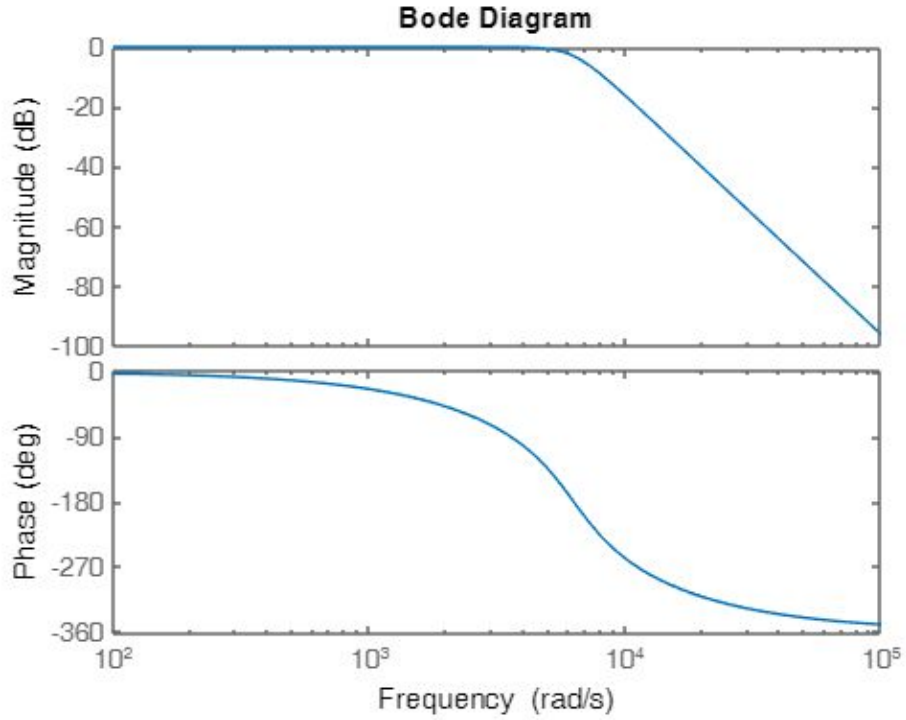
1. **Design the Butterworth filter with the following specifications:Fp=1000Hz;Fs=5000Hz;**

```
clear all;
close all;
Fp=1000;Fs=5000;Fsample=10000;

Wp=Fp/Fsample;
Ws=Fs/Fsample;

[N,Wn]=buttord(Wp,Ws,3,30);
[zeros_,poles_,scale_]=butter(N,Wn);
[num,den]=butter(N,Wn);

tf=zpk(zeros_,poles_,scale_);
bode(tf);
figure
freqz(num,den,5000,Fsample)
```



2. **Design the Butterworth filter with Fp=1000Hz,N=4;**

```
clear all;
close all;
N=4;
Fp=1000;
Wp=2*pi*Fp;
[num,den]=butter(N,Wp,'s');
fil=tf(num,den);
bode(fil);
```



3. **Design Chebyshev Type 1 filter with=4,Rp=2;Fp=1000.**

```
clear all;
close all;
N=4;
Rp=2;
fp=1000;
Wp=2*pi*fp;
[num,den]=cheby1(N,Rp,Wp,'s');
fil=tf(num,den);
bode(fil);
```