EE387 – SIGNAL PROCESSING

LAB 4

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SEMESTER 6

E/14/108

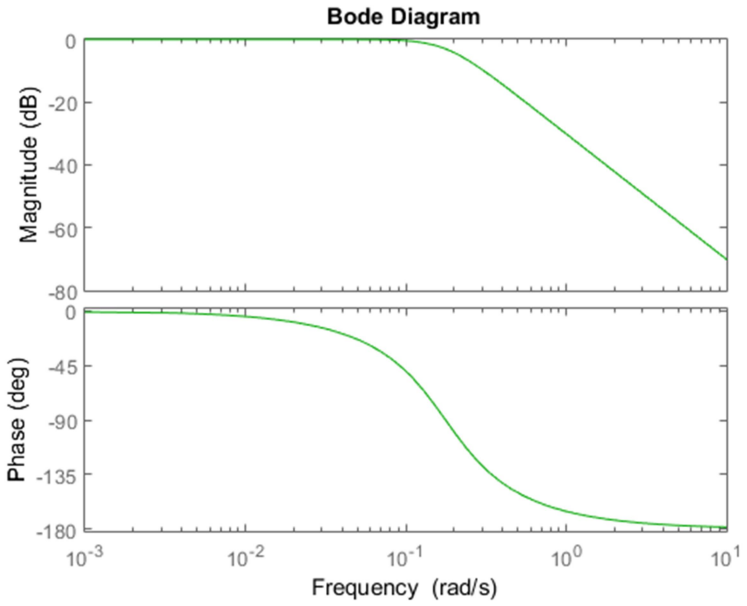
1/22/2019

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

Code :

```
clear all;

sampR = 40000;

Fp = 1000;
Fs = 5000;

Wp = 2*pi*Fp/sampR; %passband edge angular frequency
Ws = 2*pi*Fs/sampR; %stopband edge angular frequency

Rp = 3; %maximum passband attenuation in dB
Rs = 40; %minimum passband attenuation in dB

[N,Wn] = buttord(Wp,Ws,Rp,Rs);

[num,den] = butter(N,Wn,'s');

G = tf(num,den);

bode(G);
```

Output :

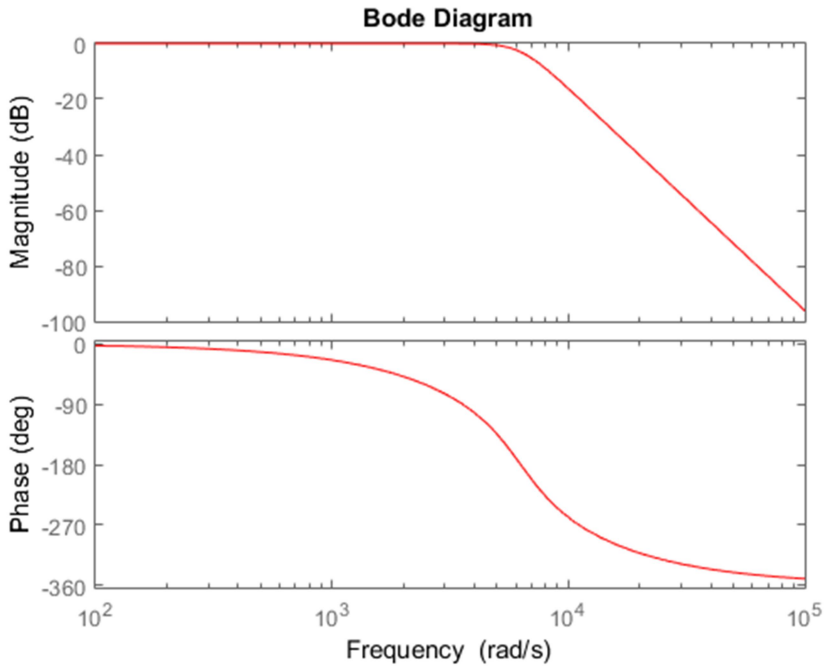


2. Design the Butterworth filter with Fp = 1000 Hz, N = 4;

Code :

```
clear all;

N = 4; %order

Fp = 1000;

Wp = 2*pi*Fp; %passband edge angular frequency

[num,den] = butter(N,Wp,'s');

G = tf(num,den);

bode(G, 'r');
```

Output :



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

Code :

```
clear all;

N = 4; %order

Rp = 2; %maximum passband attenuation
Fp = 1000;

Wp = 2*pi*Fp; %passband edge angular frequency

[num,den] = cheby1(N,Rp,Wp,'s');
G = tf(num,den);

bode(G);
```

Output :