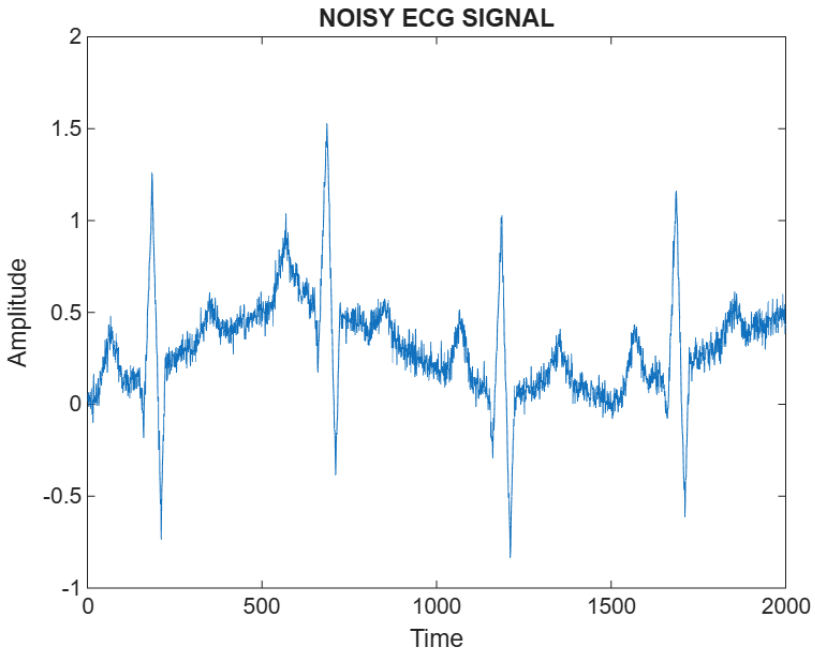
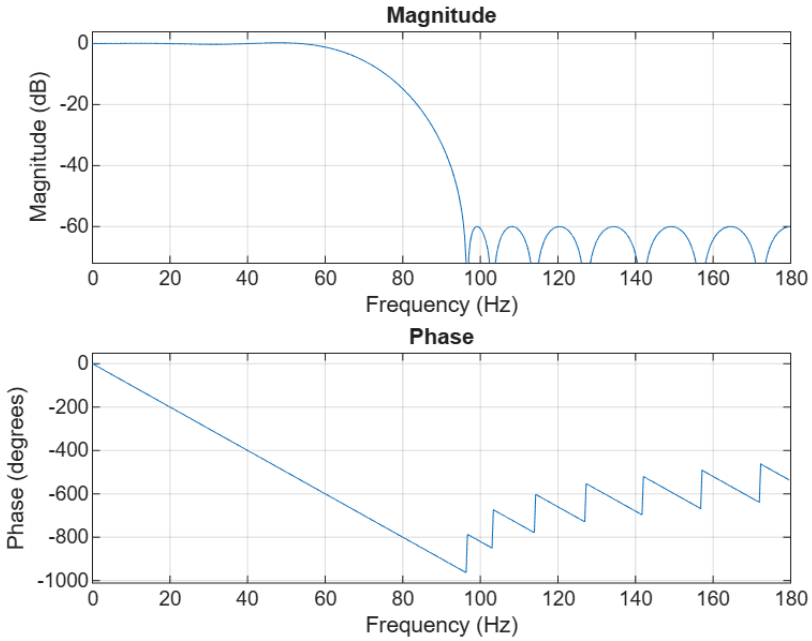
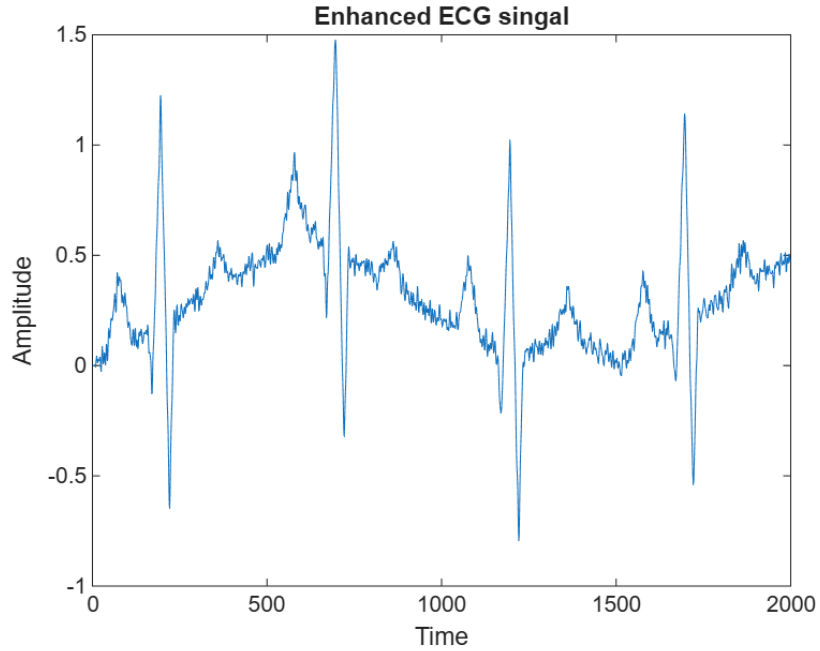
```
% design an approriate filter for ECG signal
% detection

% step 1: create noise ECG signal
load noisyecg.mat
fs = 360;

% step 2: plot ECG signal
plot (noisyECG_withTrend);
title("NOISY ECG SIGNAL");
xlabel("Time");
ylabel("Amplitude");
```




```
% step 3: design a 60hz eliminator (low pass filter) using the filter
% taskblock from TASK option
% Design a digital filter
lowpass1 = designfilt('lowpassfir', ...
   'FilterOrder',20,'CutoffFrequency',70, ...
   'PassbandRipple',1,'StopbandAttenuation',60, ...
   'SampleRate',fs);

% Visualize magnitude and phase responses
freqz(lowpass1.Coefficients,1,[],fs)
```

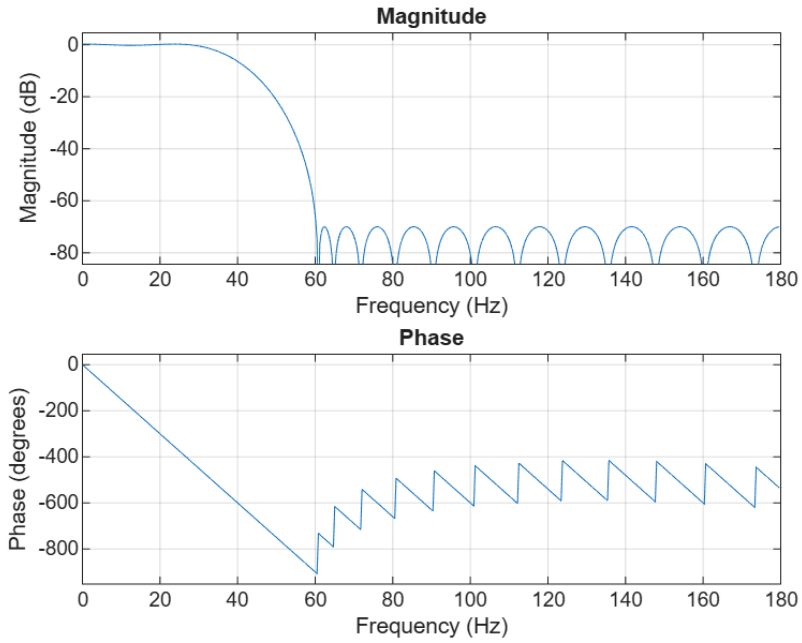



```
% step 4: apply the noisy ECG singal to design singal to the design filter and the save
enchanced singnal

Enhanced_singal = filter(lowpass1,noisyECG_withTrend);

% step 5: plot the enhanced singnal & observe the singal give it a title
plot(Enhanced_singal);
title("Enhanced ECG singal");
xlabel("Time");
ylabel("Amplitude")
```

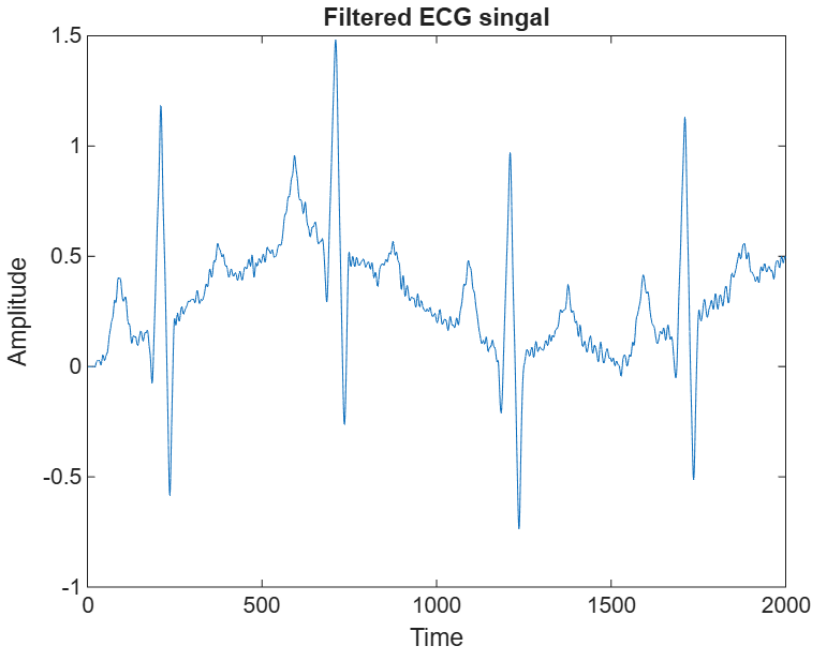



```
% step 6: now the bandpass filter for the range of 0.25 to 40hz
% Design a digital filter
band2 = designfilt('bandpassfir', ...
```

```
    'FilterOrder',30,'CutoffFrequency1',0.25, ...
    'CutoffFrequency2',40,'StopbandAttenuation1',70, ...
    'PassbandRipple',1,'StopbandAttenuation2',70, ...
    'SampleRate',fs);

% Visualize magnitude and phase responses
freqz(band2.Coefficients,1,[],fs)
```




```
% step 7: apply the designed filter to enhanced singal
filtered_signal = filter(band2, Enhanced_singal);

% step 8: plot the filter singal and observe the result
plot(filtered_signal);
title("Filtered ECG singal");
xlabel("Time");
ylabel("Amplitude")
```


Filtered ECG singal
Amplitude
Time
1.5
1
0.5
0
-0.5
-1
0
500
1000
1500
2000