

# Code Tuần 10

Trần Công Minh - 20200413

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from scipy.signal import freqz
from scipy import signal
import numpy as np
import matplotlib.pyplot as plt
plt.rcParams['axes.grid'] = True

fig, axs = plt.subplots(5)
plt.subplots_adjust(hspace=0.75)

N = 1024
t = np.linspace(0, 1.1, N)
Fs = 1000
n = t*Fs
x = 4 + np.cos(250*np.pi*t - np.pi/4) -
3*np.cos((2000*np.pi)/3 * t)
axs[0].plot(t, x, linewidth=0.75)
axs[0].set_title('Input signal')

# Tính phổ
X = np.fft.fft(x, N)
X.resize(512)
w = np.linspace(0, np.pi, 512)
axs[1].plot(w, abs(X))
axs[1].set_title('Magnitude Spectrum of Input Signal')

b = [1, 1, 1]
a = [3, 0, 0]
w, H = freqz(b, a)
f = w/(2*np.pi)
axs[2].plot(w, abs(H))
axs[2].set_title('Magnitude Response of Filter')

y = signal.lfilter(b, a, x)
axs[3].plot(t, y)
# axs[3].set_ylim(3.1, 5)
axs[3].set_title('Output signal')
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Y = np.fft.fft(y, N)
Y.resize(512)
w = np.linspace(0,np.pi,512)
axs[4].plot(w,abs(Y))
axs[4].set_title('Magnitude Spectrum of Output
Signal')
plt.show()

```

Kết quả ta được hình như sau:

