function [h,hw]=bpf()

clear all

clc

f1pass=0.4\*pi;

f1stop=0.15\*pi;

f2pass=0.6\*pi;

f2stop=0.8\*pi;

d1=1;

d2=60;

w=f2pass-f1pass;

tb=min((f1pass-f1stop), (f2stop-f2pass));

N=12\*pi/tb;

M=ceil(N/2);

h=zeros(1,N);

for n=1:N

h(n)=(sin(f2pass\*(n-M))/(pi\*(n-M)))-(sin(f1pass\*(n-M))/(pi\*(n-M)));

end

h(M)=w/pi;

figure

stem(h);

xlabel('n');

ylabel('h(n)');

title('BPF Impulse response without windowing');

fvtool(h);

xlabel('n');

ylabel('h(n)');

title('BPF without windowing');

for n=1:N

w1(n)=0.42-(0.5\*cos((2\*pi\*n)/N-1))+(0.08\*cos((4\*pi\*n)/N-1));

end

hw=(h.\*w1);

figure

stem(hw);

xlabel('n');

ylabel('h(n)');

title('Impulse response after windowing');

fvtool(hw);

xlabel('n');

ylabel('h(n)');

title('BPF after windowing');

end