Blackman window:

Code:

```matlab
%Matlab code for Blackman window
clc;
clear all;
close all;
rp=0.05;%Passband ripple
rs=0.01;%Stopband ripple
fp=1000;%Passband frequency
fs=2000;%Stopband frequency
f=8000;%Sampling frequency
wp=2*fp/f; ws=2*fs/f;
num=-20*log10(sqrt(rp*rs))-13;
dem=14.6*(fs-fp)/f;
n=ceil(num/dem);
n1=n+1;
if(rem(n,2)~=0)
  n1=n;
  n=n-1;
end
y=blackman(n1);

%Low-Pass Filter

b=fir1(n,wp,y);
[h,om]=freqz(b,1,256);
m=20*log10(abs(h));
subplot(2,2,1),plot(om/pi,m);
ylabel('Gain in db');
xlabel('(a) Normalised frequency');
title('Low-Pass (FIR Filter)');

%High-Pass Filter

b=fir1(n,wp,'high',y);
[h,om]=freqz(b,1,256);
m=20*log10(abs(h));
subplot(2,2,2),plot(om/pi,m);
ylabel('Gain in db');
xlabel('(b) Normalised frequency');
title('High-Pass (FIR Filter)');

%Band-Pass Filter

wn=[wp ws];
b=fir1(n,wn,y);
[h,om]=freqz(b,1,256);
m=20*log10(abs(h));
subplot(2,2,3),plot(om/pi,m);
ylabel('Gain in db');
xlabel('(c) Normalised frequency');
title('Band-Pass (FIR Filter)');
```
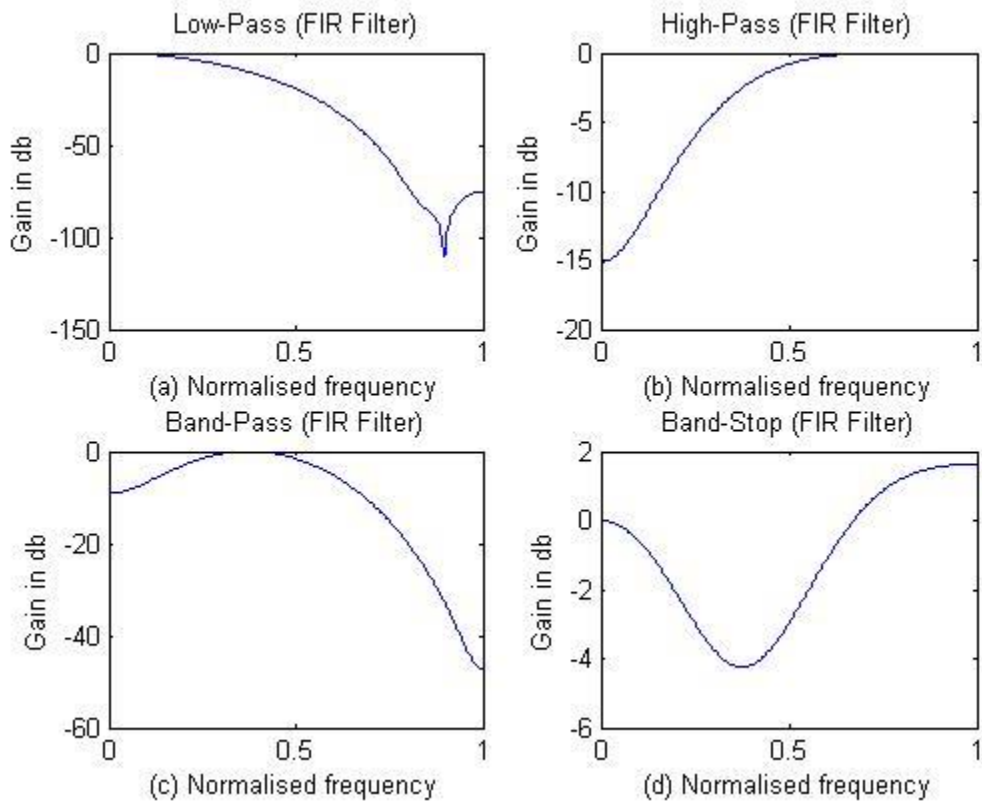
```
%Band-Stop Filter

b=fir1(n,wn,'stop',y);
[h,om]=freqz(b,1,256);
m=20*log10(abs(h));
subplot(2,2,4),plot(om/pi,m);
ylabel('Gain in db');
xlabel('(d) Normalised frequency');
title('Band-Stop (FIR Filter)');
```

OUTPUT:

Low-Pass (FIR Filter)

High-Pass (FIR Filter)

(a) Normalised frequency

(b) Normalised frequency

Band-Pass (FIR Filter)

Band-Stop (FIR Filter)

(c) Normalised frequency

(d) Normalised frequency

Hamming Window:

Code:

```matlab
%Matlab code to implement Hamming Window
clc;
clear all;
close all;
rp=0.05;%Passband ripple
rs=0.01;%Stopband ripple
fp=1000;%Passband frequency
fs=2000;%Stopband frequency
f=8000;%Sampling frequency
wp=2*fp/f;
ws=2*fs/f;
num=-20*log10(sqrt(rp*rs))-13;
dem=14.6*(fs-fp)/f;
n=ceil(num/dem);
n1=n+1;
if(rem(n,2)~=0)
  n1=n;
  n=n-1;
end
y=hamming(n1);

%Low-Pass Filter

b=fir1(n,wp,y);
[h,om]=freqz(b,1,256);
m=20*log10(abs(h));
subplot(2,2,1),plot(om/pi,m);
ylabel('Gain in db');
xlabel('(a) Normalised frequency');
title('Low-Pass (FIR Filter)');

%High-Pass Filter

b=fir1(n,wp,'high',y);
[h,om]=freqz(b,1,256);
m=20*log10(abs(h));
subplot(2,2,2),plot(om/pi,m);
ylabel('Gain in db');
xlabel('(b) Normalised frequency');
title('High-Pass (FIR Filter)');

%Band-Pass Filter

wn=[wp ws];
b=fir1(n,wn,y);
[h,om]=freqz(b,1,256);
m=20*log10(abs(h));
subplot(2,2,3),plot(om/pi,m);
ylabel('Gain in db');
xlabel('(c) Normalised frequency');
title('Band-Pass (FIR Filter)');
```

```
%Band-Stop Filter

b=fir1(n,wn,'stop',y);
[h,om]=freqz(b,1,256);
m=20*log10(abs(h));
subplot(2,2,4),plot(om/pi,m);
ylabel('Gain in db');
xlabel('(d) Normalised frequency');
title('Band-Stop (FIR Filter)');
```

Output: