

EE 311
Assignment 10

April 10, 2017
Due: April 24, 2017
NOT ACCEPTED LATE

For this assignment you will design and implement an 8th order low pass filter which has the following design specifications:

```
%Pass band 0 to 1500Hz  
%Pass band ripple 0.01  
%Stop band 2300Hz to fs/2  
%Stop band ripple 0.01
```

The filter type and the sampling frequency is given in the table below. When you design the filter using MATLAB you should override the filter order and set it to 8. All filters must be of order 8. The filter must be implemented as cascaded second order sections on the ARM board.

Your c-code should output a square wave on PA7 each cycle so that the sampling frequency can be easily verified.

Turn in the following:

1. Cover sheet with the assignment number, your name, the date turned in, your filter type and the sampling frequency.
2. A signed verification sheet showing that you implemented this filter correctly. The sheet must be signed by Dr. Blandford (only)
3. A listing of the filter coefficients for each section.
4. Your complete commented C code which implements the filter.
5. The frequency vs. amplitude plot for the filter over the whole frequency band.
6. The MATLAB code used to design the filter.

Name	Type	fs
Alhaji, Ali	Butterworth	10 KHz
AlQattan, Ahmed	Chebyshev	12 KHz
Augustin, Devin T.	Inverse Chebyshev	14 KHz
Brown, Brooks A.	Elliptic	16 KHz
Bukhari, Muhannad	Butterworth	18 KHz
Campero Vega, Axel	Chebyshev	20 KHz
Carroll, Brittani L.	Inverse Chebyshev	10 KHz
Collier, Elizabeth M.	Elliptic	12 KHz
Frey, Isaiah M.	Butterworth	14 KHz
Groves, Tyler J.	Chebyshev	16 KHz
Homadi, Ayman A.	Inverse Chebyshev	18 KHz
Jandebeur, Thomas L.	Elliptic	20 KHz
Kim, Hojun	Butterworth	10 KHz
McKinney, Matthew	Chebyshev	12 KHz
Qua, Daniel R.	Inverse Chebyshev	14 KHz
Qutub, Mohammed N.	Elliptic	16 KHz
Spillman, Jordan W.	Butterworth	18 KHz
Stephens, Ross E.	Chebyshev	20 KHz
Stowers, Adam C.	Inverse Chebyshev	10 KHz
Stratman, Jacob T.	Elliptic	12 KHz
Wagmeister, Aaron D.	Butterworth	14 KHz

Verification Sheet
EE 311 Assignment 10

I verify that _____ implemented a low pass filter in second order sections of type _____ with sample frequency of _____

```
%Pass band  0 to 1500Hz  
%Pass band ripple  0.01  
%Stop band  2300Hz to fs/2  
%Stop band ripple  0.01
```

Signed by Dr. Blandford

Note any exceptions:
