# IEE1711 Applied signal processing

## Practice 3

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**TAL TECH**

# Task 1 (Matlab filter)

- Design a lowpass, highpass, bandpass FIR filters in Matlab with windowing method (**fir1()** ), try at least 2 different window functions (https://www.mathworks.com/help/signal/ref/fir1.html#bulla52-window)

- Plot the frequency and phase responses with **freqz()** function

- Generate a uniformly distributed noise in the range -1…1, plot the noise spectrum (noise signal length >60000 points)

- Filter the noise with  FIR filters from the 1 point and plot the filtered noise spectrums

# Task 2 (Matlab filter design )

- Design a window based FIR filter with **designfilt()** function and plot it with **fvtool().**

- Use one of the window functions from Task 1.

- Filter the uniformly distributed noise and plot the spectrum

# Task 3 (GNURadio filter)

- Open GNURadio and save the file (small) with FM radio bandwidth.

- Read the file and try to filter one of the FM stations with GNURadio *Frequency Xlating FIR Filter (use firdes(). function, try decimation)*

(http://blog.sdr.hu/grblocks/xlating-fir.html)

- Plot the spectrum and spectrograms before and after the filtering

# Report should include

- Title page
- Matlab script
- Frequency and phase responses of the filters
- Filtered noise spectrums
- GNURadio screen capture
- Spectrum and spectrogram of the FM raadio signals
- Filtered signal spectrum and spectrogram
- Conclusion