

## Signals Systems: A Design Project

### Introduction:

In the Design Project project you will first decide which of three filter designs:

- A. A low pass filter of at least 8<sup>th</sup> order, cutting off at 3 kHz
- B. A high pass filter of at least 8<sup>th</sup> order, cutting off at 500 HZ
- C. A band pass filter which allows 500Hz to 3 kHz to pass.

You will simulate your design in MatLab/Simulink/Octave including:

- Importing a short music file
- Your filter as designed
- Passing the music through the filter
- Plot the Magnitude of the spectrum before and after filtering
- Play the music before and after filtering and comment on your results.
- Exporting the filtered music file to an MPG will make playing it easier at your presentation.

### Deliverables (Team uploads to Blackboard):

1. **Project Definition:** Identify your team (2 members) and define your filter choices. (Each team should do a different filter type.)
2. **Full Project Report:** including Spectral plots of your simulation results as well as documenting your design objectives and chosen solutions.
3. **PowerPoint-based presentation:** covering your system and results. Both team members should take part in the presentation.
4. **Project Audio Files:** Both the original audio file and your result after filetering as mp3 files.
5. **Project Simulation Files:** Both your filter design and simulation files from MatLab/Octave/Simulink as used by your group.

**The presentations will take place in-class during Finals week.**