ECE 535 DIGITAL SIGNAL PROCESSING

Matlab Project 3

Spring 2004

Issued: Wednesday, March 23, 2004 **Due:** Tuesday, May 4, 2004

The purpose of this project is to give you some experience with two filter design methods: window design and frequency sampling. In addition, it will give you some practice calculating frequency responses using the `fft` function.

Your solutions to this assignment should include plots and Matlab code for each exercise along with any necessary explanations or answers to questions. The latter may be handwritten or typed, whichever you prefer.

1 Preliminaries

In these exercises you will use the `fft` function to compute frequency responses. You should use the knowledge you gained from Matlab project 2 to do the frequency response plots for these exercises.

2 Discrete-Time Differentiation

Do all of the exercises in Section 7.6 of *Computer Explorations in Signals and Systems* by Buck, Daniel, and Singer. Your writeup should include answers to all of the questions in the book and any other observations you make as you complete the exercises.

Additional instructions:

- You may find it helpful to review Section 5.7 of your textbook (Oppenheim/Schafer/Buck) and our discussion of Type I-IV FIR filters prior to doing these exercises.