Fall 2018 EE 313 Linear Systems and Signals Prof. Evans

Homework #5

# Time and Frequency Responses of FIR Filters

Assigned on Saturday, October 13, 2018

Due on Friday, October 19, 2017, by 5:00 pm via Canvas submission

*Late homework is subject to a penalty of two points per minute late*.

***Reading***: McClellan, Schafer & Yoder, *Signal Processing First*, 2003, Sec. 5.4-5.9 and 6.1-6.6.

Companion Web site with demos and other supplemental information: <http://dspfirst.gatech.edu/>

Web site contains solutions to selected homework problems from *DSP First*.

The e-mail address for Mr. Houshang Salimian (TA) is [salimian.houshang@gmail.com](mailto:salimian.houshang@gmail.com).

Office hours for Mr. Salimian and Prof. Evans follow:

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| --- | --- | --- | --- | --- | --- |
| ***Time Slot*** | ***Monday*** | ***Tuesday*** | ***Wednesday*** | ***Thursday*** | ***Friday*** |
| **11:00 am** |  | **Salimian (EER 0.814 Table #4)** |  | **Salimian (EER 0.814A)** | **Salimian (EER 0.814D)** |
| **11:30 am** |  | **Salimian (EER 0.814 Table #4)** |  | **Salimian (EER 0.814A)** | **Salimian (EER 0.814D)** |
| **12:00 pm** |  | **Salimian (EER 0.814 Table #4)** |  | **Salimian (EER 0.814A)** | **Salimian (EER 0.814D)** |
| **12:30 pm** |  | Evans (EER 1.516) |  | Evans (EER 1.516) | **Salimian (EER 0.814D)** |
| **1:00 pm** |  | Evans (EER 1.516) |  | Evans (EER 1.516) |  |
| **1:30 pm** |  | Evans (EER 1.516) |  | Evans (EER 1.516) |  |
| **2:00 pm** |  | Evans (EER 6.882) | Evans (EER 6.882) | Evans (EER 6.882) |  |
| **2:30 pm** |  | Evans (EER 6.882) | Evans (EER 6.882) | Evans (EER 6.882) |  |
| **3:00 pm** |  | Evans (EER 6.882) | **Salimian (EER 1.810)** | Evans (EER 6.882) |  |
| **3:30 pm** |  |  | **Salimian (EER 1.810)** |  |  |
| **4:00 pm** |  |  | **Salimian (EER 1.810)** |  |  |
| **4:30 pm** |  |  |  |  |  |

Prof. Evans holds coffee/advising hours on Fridays 12:00-2:00pm in the EERC café.

EE 313 tutoring is available on Sundays through Thursdays from 7:00pm to 10:00pm in EER 0.814:

[http://www.ece.utexas.edu/undergraduate/tutoring](http://www.ece.utexas.edu/undergraduate/tutoring" \t "_blank)

**1. System Properties. 20 points.**

*Signal Processing First*, problem P-5.10, page 128. Use the linearity and time-invariant system properties to solve the problem.

**2. Cascaded System. 30 points.**

*Signal Processing First*, problem P-5.17, page 129.

**2. Frequency Response. 25 points.**

*Signal Processing First*, problem P-6.4, page 157.

**4. Introduction to *Z*-transforms. 25 points.**

*Signal Processing First*, problem P-6.10, page 159.

As stated on the course descriptor, “Discussion of homework questions is encouraged. Please be sure to submit your own independent homework solution.”

NOTE: In your solutions, please put all work for problem 1 together, then all work for problem 2 together, etc. Please see additional homework guidelines on the homework page.