Homework #3

### *Fourier Series and Sampling*

Assigned on Sunday, September 23, 2017
Due on Friday, September 28, 2017, by 5:00 pm via Canvas submission

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

**Reading**:  McClellan, Schafer and Yoder, *Signal Processing First*, 2003, Sec 4.1 to 4.5.
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.
Office hours for Mr. Salimian and Prof. Evans during the week of Sept. 3$^{rd}$ follow:

| Time Slot | Monday | Tuesday | Wednesday | Thursday | Friday |
|---|---|---|---|---|---|
| 11:00 am | *LABOR DAY HOLIDAY* | **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) | |
| 2:30 pm | | 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 is holding coffee/advising hours on Fridays 12-2pm at the EERC café during the fall semester from Aug. 31$^{st}$ to Dec. 7$^{th}$ inclusive except Nov. 23$^{rd}$ (due to the Thanksgiving Holidays).

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

Because of the amount time needed on Mini-Project #1, the homework #4 assignment has been reduced from four problems to two problems.

## 1. Fourier Analysis. 25 points.

*Signal Processing First*, problem P-3.12, page 67

## 2. Sampling. 24 points.

*Signal Processing First*, problem P-4.2, page 96. In addition, please complete the following part:

(d) What is the continuous-time period of $x(t)$? What is the discrete-time period after $x(t)$ has been sampled at $f_s = 15$ samples/s? The following handout might help in answering the later question:

*Course Reader Appendix D Discrete-Time Periodicity*

***Canvas:*** https://utexas.instructure.com/files/45933669/download?download_frd=1

***Mirror:*** http://users.ece.utexas.edu/~bevans/courses/signals/handouts/Appendix%20D%20Discrete-Time%20Periodicity.pdf

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 the guidelines for writing your solutions for homework problems on the homework page: