ELEG 4603 – Deterministic DSP System Design

Credits and Contact Hours

Three credit hours, 30 hours of instructor contact, 45 hours of lab time

Instructor's Name

Jingxian Wu

Textbook

1. R. Chassaing and D. Reay, Digital Signal Processing and Applications with the TMS320C6713 and TMS320C6416 DSK, 2nd Ed., Wiley-IEEE, 2008

2. Luis F. Chaparro, Signals and Systems Using Matlab, Academic Press, 2010.

a. Other supplemental materials:

1. Texas Instrument Code Composer Studio 3.1

2. Matlab.

Specific Course Information

a. Design of Digital Signal Processing systems with deterministic inputs. Sampling, quantisizing, oversampling, ADC trade-offs, distortion, equalizers, anti-aliasing, coherency, frequency domain design, audio and video compressionPre-requisites: ELEG 3124
b. Elective

Specific Goals for the Course

1. Specific outcomes of instructions

(a) Students will be able to analyze discrete-time signals and systems in the time domain.
(b) Students will be able to analyze discrete-time signals and systems in the frequency domain with discrete-time Fourier transform and discrete Fourier transform.
(c) Students will be able to analyze discrete-time signals and systems in the z-domain with z-transform.
(d) Students will be able to design various discrete-time systems by using Matlab and Texas Instruments Digital Signal Processor.

2. Indicate the student outcomes listed in Criterion 3 addressed by the course

(a) Students are required to apply knowledge of mathematics and electrical engineering in analyzing digital communication systems.
(b) Students are required to design experiments related to discrete-time linear time-invariant systems.
(c) Students are required to design various digital filters.
(e) Students are required to solve engineering problems related to discrete-time signals and systems.

(k) Students are required to use Matlab, Texas Instrument Code Composer Studio, and Texas Instrument Digital Signal Processor to design and implement discrete-time systems.

List of Topics

1. Discrete-time Signals and Systems (6 class)
2. Z-transform (6 classes)
3. Discrete-time Fourier Transform (6 classes)
4. Discrete Fourier Transform (6 classes)
5. Discrete-time Filters (6 classes)