Instructor: Prof. Juan Alvarez, 3046 ECEB, alvarez@.

Teaching Assistant: Cheng Chen, cchen130@.

Lectures: Tuesdays and Thursdays 9.30-10:50 a.m., 4026 ECEB.


Course website: https://courses.engr.illinois.edu/ece459/

Office hours:
- Mondays, 1.30-2.30pm, 3036 ECEB, Prof. Alvarez.
- Mondays, 4-5pm, 3036 ECEB, Cheng Chen.
- Fridays, 1-2pm, 4034 ECEB, Prof. Alvarez.
- Fridays, 2-3pm, 4034 ECEB, Cheng Chen.

Exams and reviews (you may bring one 8 1/2 ” by 11 ” sheet of notes to the exams. Calculators, laptop computers, cell phones, tables of integrals, etc. are neither necessary nor permitted):
- Midterm 1, Thursday, Oct 1, 9.30-10.50am, EVRT 165.
  - Review: Details TBA.
- Midterm 2, Thursday, Nov 12, 9.30-10.50am, EVRT 165.
  - Review: Details TBA.
- Final, Monday, Dec 14, 1.30-4.30pm, Room TBA.
  - Review: Details TBA.

Homework: due on Tuesdays by the end of the class period. Late assignments will receive no credit. The lowest two homework marks will be dropped to account for possible sickness or emergencies.

Grading: Your final grade will be calculated as follows:
- Homework: 20%
- Midterm exam 1: 23%
- Midterm exam 2: 23%
- Final exam: 34%

Piazza: https://piazza.com/illinois/fall2015/ece459/home

More information in the course website.
Course Outline

TOPICS

1. Representation of Signals and Systems
   ◦ Introduction
   ◦ Review of the Fourier Transform and linear systems
   ◦ Hilbert Transform and bandpass systems
2. Analog Modulation
   ◦ Amplitude modulation: AM, DSB, SSB, VSB
   ◦ Angle modulation
3. Random Processes
   ◦ Introduction to random processes
   ◦ Distribution and density functions of random processes
   ◦ Mean, auto-correlation, and auto-covariance functions
   ◦ Stationary random processes, wide sense stationary random processes
   ◦ Linear filtering of random processes
   ◦ Gaussian random processes through linear systems
   ◦ Frequency domain analysis of random processes in linear systems, power spectral density
   ◦ Noise, narrow band noise
4. Noise in Analog Modulation
   ◦ Signal-to-noise ratios in analog modulation systems
5. Digital Communication
   ◦ Sampling, quantization, quantization noise
   ◦ Pulse code modulation, DPCM, delta modulation
   ◦ Baseband pulse transmission, detection error probability
   ◦ Digital passband transmission (PSK, QPSK)