CRN 21552:

Class Time: Monday, 09:30-12:20
Location: MED A11

Signals and Systems for CE
BLG 354E

2017 - 2018 Spring Term

General Info

- **Instructor:**

CRN 21552: Prof. Dr. Gözde ÜNAL

Class Location:

Office: EEB- 5309

Email: gozde.unal@itu.edu.tr

General Info

- **Course Assistants:**

-- Enes Albay

Email: albay@itu.edu.tr

Office: Vision Lab

Office Hour: TBA

General Info

- **Prerequisites:**

  --Basic Linear Algebra Knowledge.

  --Basic Calculus Knowledge.

  --Basic Programming Skills.

General Info

- **Textbook:**
- "*Signal Processing First*" by James H. McClellan, Ronald W. Schafer, Mark A. Yoder, Prentice Hall, 2003.

-- "Signals and Systems", Oppenheim and Wilsky, Pearson.

- **Software tool:**

MATLAB or Python

- **Additional Sources:**
- -- Course Slides

-- MIT Open Courseware : Signals and Systems Course materials

General Info

- **Grading Policy:**

  5 Homeworks → 4 x 5=20 %

  Attendance Quizzes Every Week→ = 10 %

  1 x 12 (lowest 2 out of 12 will be deleted)

  1 Midterm → 1 x 30= 30 %

  1 Final→ 40%

  VF Conditions (Final Exam Conditions)→

  * 70% Attendance to Lectures (through the Quizzes attendance is taken at TopHat System.)

  * At least 3 Homeworks submitted. A homework is counted as submitted when it receives a minimum grade: 25/100

  * Weighted Average of Midterm + HWs + Quiz > 30/100

Cheating attempts : Disciplinary Action will be taken.

Interactive Teaching Platform: Top Hat will be used throughout the course

- **Prerequisites:**

-- https://tophat.com/

-- You need to register for an account:

You will receive an email in the following daya. Please, follow a link you receive by ITU email

Weekly Schedule /Tentative

Week	Content
05.02.2018	Introduction, Sinusoids, Complex Exponential
12.02.2018	Phasors, Spectrum Representation
19.02.2018	Fourier Series-1
26.02.2018	Fourier Series-2
05.03.2018	LTI systems, FIR Filters
12.03.2018	Convolution - 1
19.03.2018	Convolution - 2
26.03.2018	SPRING BREAK
02.04.2018	Frequency Response of FIR Filters
09.04.2018	MIDTERM EXAM
16.04.2018	Continuous-time Signals and systems
23.04.2018	Impulse response/ Frequency response of CT systems
30.04.2018	Continuous time Fourier Transform(CTFT) and DFT
07.05.2018	FT Applications: Modulation
14.05.2018	FT Applications: Sampling

Learning Outcomes

- 1. Describe a periodic signal in time domain by defining its properties such as the fundamental period and fundamental frequency
- 2. Define a periodic signal as a sum of sinusoids or complex exponentials, i.e. create Fourier series representation of a periodic signal through both Fourier synthesis and analysis equations
- 3. Construct the spectrum representation of a periodic signal
- 4. Identify Finite Impulse Response systems, Linear Time Invariant Systems, and their properties
- 5. Define the impulse response of an LTI system both in continuous time and discrete-time, and system properties such as stability and causality
- 6. Define the frequency response of an LTI system and its properties
- 7. Construct forward and inverse Fourier Transform of both periodic and non-periodic continuous-time signals
- 8. Describe ideal frequency selective filters (low-pass, high-pass, band-pass) in frequency domain
- 9. Perform frequency filtering over the spectrum of a signal
- 10. Describe Sampling Theorem and conversion between continuous time and discrete-time domains
- 11. Describe principles of an Amplitude Modulation and Demodulation System
- 12. Implement the above concepts in a programming environment (MATLAB)