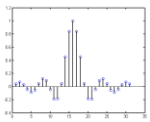
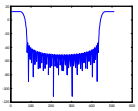


$h[n]$

EE430 Course Syllabus: Fall 2018

$H(e^{j\omega})$ 

Course Description: Building upon the basic theory of signals and systems analysis, this course introduces the student to the theory and applications of digital signal processing. Topics covered include the representation of discrete-time signals, frequency domain and Z-domain analysis of discrete-time signals and systems, discrete Fourier transform, sampling, A/D & D/A conversion, transfer functions, frequency response, minimum and linear-phase systems; design of FIR and IIR filters, FFT algorithm and structures, Experience in the design, implementation and application of DSP techniques is acquired by the help of MATLAB-based project.

Lecturers: Buyurman Baykal (Sec. 1) [office: D-121/2]
Tolga Çiloğlu (Sec. 2) [office: D-103]
Fatih Kamışlı (Sec. 3) [office: C-108]

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Grading: *Tentative* weights towards final grade:
Midterm-1 20%, Midterm-2 20%, Final 30%,
Project (Progress 4%, Final Demo 8%, Report 4%), Homework 10%, Attendance %4

Textbook: Discrete-time Signal Processing, 3rd ed., Oppenheim, Schafer, Pearson, 2010.

References: Digital Signal Processing 2nd ed., Sanjit Mitra, McGraw Hill, 2002.
Signal Processing First, McClellan, Schafer, Yoder, Prentice Hall, 2003

MATLAB: MATLAB For Beginners: A Gentle Approach, Peter I Kattan, 2008
Mastering MATLAB®: A Comprehensive Tutorial and Reference, D. Hanselman, Prentice Hall, 1996.
Digital Signal Processing Using MATLAB®, 3rd edition, Vinay K Ingle, John G Proakis, 2011.
Digital Signal Processing Laboratory Using MATLAB®, Mitra, McGraw Hill, 1999.

Course Outline

WEEK	LECTURE TITLE (Section from the textbook)	HW due	MT date	Proj. due
1.	Introduction to DSP, Discrete-Time Signals and Systems (Sec. 2.1, 2.2, 2.3, 2.4)			
2.	Discrete-Time Signals and Systems, *cont'd* (Sec. 2.5, 2.6, 2.7)			
3.	Discrete-Time Signals and Systems, *cont'd* (Sec. 2.8, 2.9)			
4.	Z-transform (Sec. 3.1)	HW1		
5.	Z-transform *cont'd* (Sec. 3.2, 3.3, 3.4)			
6.	Discrete Fourier Transform (Sec. 8.1, 8.2, 8.3)			
7.	Discrete Fourier Transform, *cont'd* (Sec. 8.4, 8.5, 8.6, 8.7)	HW2	Fri 16/11	
8.	Sampling of Continuous-Time Signals (Sec. 4.1, 4.2, 4.3, 4.4, 4.5)			
9.	Sampling of Continuous-Time Signals, *cont'd* (Sec. 4.6, 4.8)			
10.	Transform Analysis of LTI systems (Sec. 5.1, 5.2, 5.3)			Phs1
11.	Transform Analysis of LTI systems, *cont'd* (Sec. 5.4, 5.5, 5.6)			
12.	Transform Analysis of LTI systems, *cont'd* (Sec. 5.7), Filter Design (Sec. 7.1, 7.2)	HW3	Fri 21/12	
13.	Structures for Discrete-time Systems (Sec. 6.1, 6.2, 6.3, 6.4, 6.5)			
14.	Computation of DFT, (Sec. 9.1, 9.3)			
17.	week after finals			Phs2

Project: Students will work in pairs for their project assignments in MATLAB. The project consists of two phases. Students are required to make presentations in the lab at the end of Phase-2. The final project report will be presented on the due date of Phsase-2.

Homework: There will be 3 homework assignments. Homework will be announced and collected on ODTUCLASS. Homework is usually composed of two parts, namely written and MATLAB parts. MATLAB assignments will be returned by submitting simulation results (plots, tables, etc.) and .m files. Late homework submissions will not be accepted.