



EUROPEAN UNIVERSITY OF LEFKE

Electrical and Electronics Engineering, Faculty of Engineering

SYLLABUS

2019-2020 Spring Semester

Course Code	Course Name	Course Type	Weekly Course Hours			Credits	ECTS	Weekly Time Schedule
			T	A	L			
ECE408/EE464	Digital Signal Processing	Major	3	0	0	3	6	Tuesday @ 15:00-17:50; AS-112
Prerequisite		Prerequisite to						
Course Lecturer	Soydan Redif					Office Hours Schedule	On instructor's timetable.	
E-mail	sredif@eul.edu.tr							
Phone						Office / Room No	AS-314	
Teaching Assistant	Ahmet Yasli					Phone	3504	
E-mail	ayasli@eul.edu.tr					Office / Room No		
Catalogue Descriptions	Discrete-time signals, the relationship between continuous and discrete-time transforms, and the sampling theorem. System properties. The impulse response of discrete time, linear time-invariant (LTI) systems and the convolution sum. The z-transform and its properties. Design and analysis of LTI systems using the z-transform. Filter structures. Design of FIR and IIR digital filters. Characterization using linear difference equations. Signal analysis using the discrete Fourier transform and the fast Fourier transform (FFT). Analysis and simulation using the MATLAB software package.							
Course Objectives	This course aims to give students the necessary skills for analysing and synthesising algorithms and systems that process discrete-time signals, with emphasis on realization and implementation							
Learning Outcomes	On successful completion of the course, students should understand: (1) discrete-time signals & systems, and system properties, (2) digital LTI systems and the convolution sum, (3) the z-transforms and region of convergence, (4) the design digital filters using the bilinear transform method, (5) computational tools for the analysis of signals and manipulation of LTI systems.							
Textbooks	1	E. C. Ifeachor and B. W. Jervis, Digital Signal Processing: A Practical Approach, Englewood Cliffs, N. J. Prentice-Hall, 2001. ISBN: 0201596199.						
	2	B. Mulgrew, P. Grant and J. Thompson, Digital Signal Processing: Concepts and Applications, 2nd Ed, Palgrave Macmillan, 2003. ISBN: 0333963563.						
	3	S. K. Mitra., Digital Signal Processing: A Computer based approach, MCGraw-Hill, 4th Ed., 2011. ISBN: 0071289461.ISBN: 0071289461						
WEEK	Date	TOPICS						Reference No - Section
Week 1	18/02/2020	Intro and review of discrete-time (DT) signals						1: 1.1-1.8
Week 2	25/02/2020	Review: system properties (linearity, time-invariance, causality, stability)						1: 2.1-2.4
Week 3	03/03/2020	Review: LTI systems and DT convolution						1: 2.5-2.9
Week 4	10/03/2020	LTI systems continued						1: 3.1-3.4
Week 5	17/03/2020	Sampling continuous-time signals and the Nyquist criterion						1: 3.3; 3.5-3.7
Week 6	24/03/2020	Z-transform: properties and region of convergence						1: 4.1-4.4;4.6
Week 7	31/03/2020	Z-transform: difference equations for LTI systems						1: 5.1-5.4
Week 8	07/04/2020	Properties of digital filters: FIR and IIR filters and their structures						1: 6.1-6.3;7.1-7.4
Week 9	11-18/04/2020	Midterm Exam Week						-
Week 10	21/04/2020	Properties of digital filters: lowpass, highpass, bandpass and bandstop filters						1: 6.1-6.3
Week 11	28/04/2020	FIR digital filter design: window and Kaiser methods						1: 6.4-6.6
Week 12	05/05/2020	IIR digital filter design: bilinear transform method						1: 7.1-7.3
Week 13	12/05/2020	IIR digital filter design: bilinear transform method						1: 7.1-7.3
Week 14	19/05/2020	DT Fourier representations: DFT, FFT						1: 8.1-8.3
Week 15	28-07/05-06/2020	Final Exam Week						-