

ELEC4505 COURSE CATALOG INFO

Course Code : ELEC4505				Course Name : Applied Digital Signal Processing			
Semester	Lecture (Le+T+L)	Local Credit	ECTS	Language	Category	Instructional Methods	Prerequisites
7 or 8	(3+0+0)	3	5	English	Elective	Lecture	ELEC3504
Course Content	Review of programming and simulation tools: Matlab and Simulink. Review of fundamentals of digital signal processing. Definition of basic signals in MATLAB. Sampling and reconstruction. A/D and D/A conversion. Difference equations. The Z-transform. Discrete convolution. Digital filter design. Frequency response of LTI systems. Discrete Time Fourier Transform (DTFT). Discrete Fourier Transform (DFT). Fast Fourier Transform (FFT). Audio, speech and image processing applications in MATLAB and Simulink.						
Course Outcomes	<p>CO 1. Explain the fundamental properties and representations of the discrete time signals and systems.</p> <p>CO 2. Design the digital filters using filter design tools in MATLAB.</p> <p>CO 3. Compute the Discrete Fourier Transform using FFT algorithms.</p> <p>CO 4. Apply some advanced digital signal processing algorithms and methods to audio, speech and image processing areas.</p>						

COURSE PLAN	
W1	Review of matlab programming: Matlab and Simulink
W2	Discrete time signals and systems
W3	Discrete time signals and systems
W4	Fourier representation of signals
W5	Fourier representation of signals
W6	Discrete Fourier Transform (DFT)
W7	Discrete Fourier Transform (DFT)
W8	Fast Fourier Transform (FFT)
W9	Design of FIR filters
W10	Design of IIR filters
W11	Audio, speech and image processing applications in MATLAB and Simulink.
W12	Audio, speech and image processing applications in MATLAB and Simulink.

W13	Audio, speech and image processing applications in MATLAB and Simulink.
W14	Audio, speech and image processing applications in MATLAB and Simulink.

COURSE ASSESMENT AND ECTS WORK LOAD			
Type of Work	Count	ECTS WORK LOAD	
		Time (Hour)(Including prep. time)	Work Load
Attendance	14	3	42
Final Exam	1	30	30
Quizzes			0
Term project			0
Reports			0
Final Project			0
Seminar			0
Assignments			0
Presentation			0
Midterms		20	20
Project			0
Laboratory		0	0
Tutorial		0	0
Other(Self study, Paper reviews)		33	33
		Total work load	125
		Total work load/25	5
		ECTS Credit	5

PROGRAM OUTCOMES - COURSE OUTCOMES RELATIONS

PO	Program Outcomes	CO
1	1.1. Adequate knowledge in fundamentals of mathematics (algebra, differential equations, integrals, probability etc), science (physics, chemistry, biology etc.) and computer science (programming and simulation);	
	1.2. ability to use theoretical and applied knowledge in these areas in complex engineering problems.	
2	2.1. Ability to identify, formulate, and solve complex engineering problems;	1,...,4
	2.2. ability to select and apply proper analysis and modeling methods for this purpose.	1,...,4
3	3.1. Ability to design and integrate components of a complex system or process, as they relate to Electrical and Electronics Engineering discipline, under realistic constraints and conditions, in such a way as to meet desired requirements;	
	3.2. ability to apply modern design methods.	
4	4.1. Ability to devise, select, and use techniques and tools needed for analyzing and solving complex problems encountered in engineering practice;	
	4.2. ability to employ information technologies effectively.	
5	5.1. Ability to design experiments,	
	5.2. ability to conduct experiments, gather, analyze and interpret data.	
6	6.1. Ability to work in intra-disciplinary teams;	
	6.2. ability to work in multi-disciplinary teams;	
	6.3. ability to take individual responsibilities.	
7	7.1. Ability to effectively communicate via written and oral means;	
	7.2. knowledge of at least one foreign language;	
	7.3. ability to write effective reports and comprehend written reports;	
	7.4. ability to write design and manufacturing reports	
	7.5. ability to present effectively,	
	7.6. ability to give and follow clear instructions.	

8	8.1. Recognition of the need for lifelong learning;	
	8.2. ability to access information, to follow developments in science and technology, and to continue to educate him/herself.	
9	9.1. Consciousness to behave according to ethical principles, and about professional and ethical responsibility;	
	9.2. knowledge on standards used in engineering practice.	
10	10.1. Knowledge about business life practices such as project management, risk management, and change management;	
	10.2. awareness in entrepreneurship, innovation;	
	10.3. knowledge about sustainable development.	
11	11.1. Knowledge about the global and social effects of engineering practices on health, environment, and safety, and contemporary issues of the century reflected into the field of engineering;	
	11.2. awareness of the legal consequences of engineering solutions.	

Revision Date	Prepared by	Approved by
1.9.2019	Prof.Dr. Ümit Güz	Prof.Dr. Ahmet Aksen
1.6.2021		